A Handbook of Evaluation in Geography

A HANDBOOK OF EVALUATION IN GEOGRAPHY

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राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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Foreword

The National Policy of Education, 1986 conceives of Comprehensive Continuous Evaluation as built-in aspect of the Teaching-Learning Process.

Here the emphasis is on evaluation by the teacher who has not only to plan but also develop and use evaluation materials to suit to the needs of the learners It is, therefore not only necessary that the teacher knows the subject but also how to continuously assess the learning outcomes and to get feedback with a view to further improving the performance and proficiency of the pupils It is only by using a variety of evaluation techniques, tools and procedures that continuous and comprehensive evaluation can be effectively undertaken

In this context the teacher invariably needs some guidance about the theoretical constructs of evaluation and concrete illustrations of their application in their day-to-day work Covering the different dimensions of evaluation as also the use of variety of techniques and tools, the present publication entitled A Handbook of Evaluation in Geography, will be of immediate use to the teachers of the subject at all the school stages.

I am glad that the Department of Measurement Evaluation, Survey and Data Processing has decided to bring out a series of publications of this kind in different subject areas The NCERT has great pleasure in placing it in the hands of the teacher community and it is hoped that it will be found of interest and use to them.

P.L. MALHOTRA
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Preface

Though the theoretical concept of the two way relationship between instructional objectives, learning experiences and evaluation techniques finds a frequent mention in educational literature, its practical illustrations are hard to find. The present document is a valuable attempt in this direction With its focus on evaluation, it tries to bring to the fore the strong and close links it has with the other two ends of the triangle.

The publication highlights the importance of process objectives at the primary stage, product and logical objectives at the secondary and senior secondary stages.

It also attempts to make field work an integral part of learning geography and in this endeavour leads the readers to the use of the unconventional and non-test techniques of evaluation.

The comprehensive and integrated treatment that the document gives to the diverse and differential instructional objectives, content, methodologies and evaluation techniques is likely to make it a handbook of ready reference for the teacher of geography who have also to assume a parallel and imperitive role of being evaluators.

I congratulate Ms Kamla Menon of the faculty of this Department for the untiring effort she has thoughtfully invested in accomplishing this work of great practical utility and theoretical significance. I must also thank one and all of those whose collaboration she sought and received in the development of the document.

To increase the utility of this Handbook any suggestion for its further improvement will be willingly received and incorporated.

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GANDHIJI'S TALISMAN

"I will give you a talisman.Whenever you are in doubt or when the self becomes too much with you, apply the following test :

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it ? Will it restore him to a control over his own life and destiny ? In other words,will it lead to Swaraj for the hungry and spiritually starving millions ?

Then you will find your doubts and your self melting away."

mkgandhi

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Introduction

With the growing concern to make evaluation more meaningful and using it for the improvement of learning rather than merely for certification the need for sufficient illustrative material had initiated the preparation of this Handbook on Evaluation in Geography Through the text, illustrations and sample material this Handbook enables the teacher to see the casual relationship between defining attainable objectives of learning, planning teaching learning strategies and assessing students learning

The development of this handbook is based on the suggestions of the resource development group consisting of university, secondary school and teacher training college representatives who reviewed and finalised the approach, content and organization of this book.

The handbook is meant for the ready reference of geography teachers and particular, for developing test items or planning the evaluation system

The major part of this Handbook deals with the use of objectives for teaching and testing geography and the development of teacher-made written and practical tests both at the elementary and secondary stages A major emphasis in these chapters is on the objective basedness of the evaluation process and the advantages of teaching and testing all of these objectives in Geography.

In addition a chapter dealing with the use of test results indicating the importance of and suggesting simple statistical methods for processing test results and reporting is given. Throughout an attempt has been made to enable the direct use in the classroom of these techniques However, theoretical considerations like the steps to improve validity, and reliability of the tests and selection of the approach for defining objectives have been discussed with a view to focus Geography Teachers and curriculum framers, attention on these vital issues.

The successful completion of this handbook would not have been possible without the cooperation of many individuals and agencies, to whom I express my sincere appreciation.

Reviews of the chapters by late Dr A.D. Banerjee and Dr. Pritam Singh are acknowledged and appreciated

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KAMALA MENON

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CHAPTER I

Issues in the Teaching and Testing of Geography in Today's Schools

The introduction of geography as a separate subject in the school curriculum in our country is not a recent phenomena. In spite of the continuing problems of access to materials, availability of trained teachers or, for that matter standard textbooks, the subject continues to find a distinct place in the school syllabus from primary through elementary, to secondary stages

Geography as a School Subject

The purpose of teaching social sciences as identified in the syllabi proposed by the NCERT is to enable children to explore and understand the environment, both physical and social, systematically and scientifically (Parikh) At the primary stage, exploration, discovery and use of the methods of enquiry are the main outcomes of learning and at the middle stage the information on the diversity and role of man's efforts in relation to time, space and present institutional structures Geography teaching at this stage is mainly descriptive accounts of how man lives in the variety of environments found in the world. Skills of reading maps, finding directions and stating locations. In combination with the history of India and India's economic progress a view of the world and the country is afforded At the secondary stage the change is effected to a synoptic view of man and environment and a history of world as also the Indian political system. The descriptions of lands and people are used to illustrate the principles of physical and economic geography

The first 10 years of school in which geography is to be learnt by all the students the curriculum is organised from the view point of introducing world geography to the child and providing an explanation of the physical processes The economic and social aspects of geography are regional based and give descriptions of the countries and its people The content of geography decides the method which is identified for this stage as systematic and developing from as being local environment providing a basis for world regional geography Following this pattern even in the different States there is similar organisation of syllabi in geography, except for West Bengal and Rajasthan where local geography of the State and Samples studies of man in different countries are deviating from the former approach The physical elements of geography however are taught as process not as explanations for economic or social patterns (except in the case of climatic regions). This pattern is adopted by all the state with varying degrees of details

In the present context the purpose of teaching geography is mainly to inform the learner of the distribution pattern of phenomena on the surface of the earth and some elementary reasoning as to why such variety and distribution occurs Some of the most successfully used understandings prevalent are that there is a pattern in the distribution of phenomena on the surface of the earth which endows different areas with a variety of resources, used by Man in accordance with his technology and economic status

Approaches to Teachings of Geography at the School Stage

Limited as it is to the present syllabus the approach to teaching the subject and the objective in turn are predefined It is clear that when dealing with descriptions of the economy of any country at least some of the reasons from the physical geography content is given It is often categorically stated that alluvial soils are best suited for the cultivation of crops though all evidence from the that country, particularly France, proves that it is the plateau which has more agriculture than the plains Often apparent, not actual causes are drawn because of the method of finding reasons by selecting from a variety of known reasons ,by not only analysis.

It, therefore, becomes necessary to be able to have a general idea as to what the other approaches of geography teaching afford pupil evaluation The place of geography as the spatial distribution of phenomena integrating the physical and social phenomena holds the argument that physical and economic geography the distinct aspect ann can be inter-related in terms of cause and effect It is true that this spirit often gets lost in some textbooks and the attempt to find a physical cause where historical or social factors have operated, leads to a view that is termed deterministic. In recent efforts there is a definite preference for introducing the concepts of geography so as to develop the regional viewpoint The spatial structures and their recognitiuon (earlier termed map reading now more comprehensively termed graphically) leading to the identification of regional patterns has been recommended The content remains descriptions of the distribution of phenomena the reasoning moves away from regional description to explanations in terms of spatial concepts Nodes, accessibility, nearest neighbour, ranksize rules, hierarchies, settlement patterns, etc. are the terms familiar to all which belongs to the concept based approach to geography It is hard as it is to remember where what is on the map and the concept based approach draws heavily from the physical sciences and sociology for which the theoretical basis has to be explained before such reasoning is attempted.

Interwoven with these approaches are the attempts to introduce the method of the subject, simulation games in geography are increasingly being used to develop this aspect. The attempt is to be able to apply the concepts in hypothetical situations, construct a reason and verify it in terms of actual or known phenomena Other than this the concepts are used to try and construct alternate interactions and experiment with its efficacy Questions involving reasoning and could there have been industrialization on the Central Massif of France are often used to illustrate the use of this approach Theory, it is argued, help the learners to develop an interdisciplinary synthesis of phenomena and make relevant descriptions and reasons, not just repeat causes borrowed from the physical sciences

In certain other exercises of organising content in geography country studies are taken up as the case and both systematic as well as the methods of geography are introduced The approach envisages the identification of not only the spatial patterns formed by the physical and social phenomena but also the identification of the region that exist in terms of formal criteria of climate and relief For these regions the man-resource relationships, the occupational structure, demographic variations are compared and explained In an indirect way the concepts of region, evolution, change, growth, development are explained Again, the geographical spatial aspects do not get highlighted at the school stage Often suggested, but never wholly accepted is the integrated study of geography as it is wrought with problems related to deletion of content of geography which do not find a place in integration (trade and transport for example); will only synthesis in a spatial context be possible, what will happen to reasoning in geography, is it correct to only use maps to represent geography in integrated studies since reasons are found in the other subjects, too. However, as a part of social studies in the elementary stage and, after the initial exercise in the 60s, the approach is still hankered after but has never evolved completely nor replaced the systematic approach

The question now arises as to why change has come in the geography syllabi slowly and moderately unlike in history or science The issue is obvious, the local environment based approach suited to the elementary stage cannot be extended upto the higher secondary stage if world geography and country studies have also to be introduced. Keeping only country studies is old fashioned, however adequate, but deludes a holistic view of world patterns. It is considered more suitable for indepth analysis as at undergraduate levels In this situation the systematic country studies based approach repeating similar concepts at different stages with examples initially from one's own environment to that of the world and then one's own country has proved most. successful but the school stage so far.

Graphicacy in Geography Learning

Problems, however, continue to exist with aspects of map reading, drawing and interpreting. Always considered essential to the geography curriculum this area is always segregated as practical geography (probably because arithmetic is involved) and in recent curriculum renewal efforts is often deleted since it is difficult probably because of the perceptual learning problems. Though accepted in discussions that field work and practical geography cannot be provided as often as maps and pictures, preference for excursions continues to exists instead of chain and tape survey or preparing simple local area maps, with directions and scale, in the syllabus

In spite of there being several alternatives, the concept based integrated country studies, sample thematic based, to teaching geography the systematic approach finds the most favour presently In this context testing too taking on from the approach continues to be description based answers to lets-find-out type questions

Aspects of Evaluation in Geography

In order to use such information loaded syllabus for more comprehensive testing requires the identification of the objectives of teaching geography in order to build the testing programme for not only information but understanding and use of information The purpose of teaching geography is to widen the child's world view, introduce spatial dimensions of different phenomena, explain the processes of development and relationship of man with resource The testing can be in broad based only if in the teaching of geographical concepts elements of explanation of seeing patterns on space which are actual and not descriptive, translating the principles of cost, time, distance, evlauating locational advantages as learnt in history, economics and science when explaining the geography of a country Perceiving uniformity, diversity, interaction, accessibility, concerntration, dispersion, interdependence of phenomena, both social and physical, identifying regions in country studies Primarily visualization of physical features, man's use of resource, impact of reorganising activity on space, effect of environment on limiting human activity, spatial support of economic links an role of planning in effecting change is to be attempted at all stages Applying principles, verifying causes and effects, drawing conclusions are all steps in formal scientific method which can be taught for and thus tested

Problem-based geography is a outcome of the type of instruction in which why of the distributions of phenomena are identified from given alternative explanations using the principles of spatial interrlationships What this approach is not, is giving reasons for distributions of crops as shown in a country in terms of soil types alone Neither is it superimposing physical and economic data on a map and identifying areas where both phenomena are higher or one is more than the other, commonly known as finding correlations this cannot be passed off as explanation in geography, this is only identifying patterns Teaching for developing geographical concepts as distint from history, economics or science requires teachers to find spatial interactions and seek explanations from other disciplines this would be true integration and problem centred

The testing materials which are easily accessible are the questions at the end of the lesson meant for review and drill, question papers of previous board examinations which are based for preparing for these same exams and the map exercise books which are based on the textbook Drill and finding out are the main outcomes realised by the existing 'test material'. What is also available but litttle used for assessment are the questions asked by the learners, queries that come up during instruction, aspects of graphicacy in which errors abound and learning is still partial, self test questions, concept-based tests to identify errors, readiness test for simple map reading skills, map interpretation tests are the variety of tests which can be used provided the teacher makes them tailored to the class requirements.

In the instruction process is to effectively try and prepare for geography learning which not only enable pupils to describe countries and regions but also to explain the pattern of distribution of phenomena, relate these patterns with economic and social reasons, then evalution has to effectively incorporate these aspects in questioning used in day to day testing The use of questions which are based on textual materials alone obviously restricts the scope of testing. The introduction of passages from travel diaries, descriptions of regions from gazetteers, hypothetical situation, problems related to land use or settlement layout for testing effectively provides material for critical analysis and even evaluation by the learner The testing programme has to evolve from the teaching priorities and not be allowed to dominate the instruation process. The flexibility of testing is its advantage and the efficacy of use of different approaches for teaching the subject of geography can be evaluated by developing evaluation programmes accordingly.

There is need to view geography at the school stage as being not only for introducing information about the earth but also enabling the child to suggest uses and explain various patterns observable on the earth's surface Evaluation must, therefore, follow closely with a diversity in the methods used Paper-pencil tests, of course would be most popular but the practical examination open book tests assignments, and field work-based reports need to be used more often so that geography and not descriptions of countries is learnt.

CHAPTER II

Defining Objectives for Evaluation

Evaluation—its Purpose and Scope

Evaluation is not merely a collection of techniques, it is a process—a continuous process which underlies all good teaching and learning From an educational view point, evaluation may be defined as a systematic process of determining the extent to which educational objectives are achieved by pupils. There are two important aspects of this definition First, it implies a systematic process and second, it always assumes that educational objectives have been identified Without previously determined objectives it is not possible to judge the extent of progress.

Evaluation is a much more comprehensive and inclusive term than measurement Evaluation includes, both qualitative and quantitative descriptions of pupil behaviour plus value judgments concerning the desirability of that behaviour, whereas measurement is limited to quantitative descriptions of pupil behaviour Measurement does not include qualitative description nor does it imply judgements concerning the worth or value or the behaviour measured The following clearly shows the relationship between measurement and evaluation:

(1) Evaluation	Quantitative descriptions of pupils (measurement + evaluation judgements)
(2) Evaluation	Qualitative + descriptions of pupils (non-measurement + evaluation judgments)

Evaluation may or may not be based on measurement The main emphasis in evaluation is on the extent to which education goals are achieved

The main effort of planning instruction is to decide what the targets of teaching are to be. The definition of these targets, when used for evaluation, can be at different levels:

1 *Using objectives to assess*

(i) how many of these were achieved by students
(ii) how many students achieved each of these objectives
(iii) what changes need to be made in instructional procedures
(iv) what differences does the method of instruction have with another to achieve the same objectives

Therefore the use of objectives is both for evaluation at the end of the course and during instruction.

Evaluating End of Course Objectives

The planning for evaluating the terminal objectives is ensured by planning the examination to be taken at the end of the course. As will be discussed in subsequent Chapters preparing a blue print, framing questions, sampling each of the objectives and content elements, controlling the testing situation and using the result to classify, promote or rank pupils is how these terminal objectives are used.

The assessment of each pupil is done on the basis of the number of correct answers given. Analysis of the pupil performance is usually such that for each objective the pupil's performance is listed. The shortcoming is that even if all the objectives are not achieved as in the case when a student is given a score which is taken to mean that the student has passed.

Example·

In a final exam in geography the weightage assigned to three objectives were·

	Aspects to be evaluated	*Weight assigned to each objective*	*S-1*	*S-2*	*S-3*
A	Knowledge of information regarding types of earth movements	2	1	2	1
B	Explains the relationship between folding and mountain type formation	3	2	2	3
C.	Infers the assumptions in the mountain building theories of collection and drift.	5	3	4	3
D	Locate fold, fault residual and block mountains on the map	3	2	0	1
	Total	13	8	8	8

Evaluating the Entry Skills

When deciding what objectives are to be kept for evaluation at the end of the course it is useful to know what pre-requisite information the learner had. Also, in order to diagnose the reasons why the objectives as we had defined were not achieved, entry level objectives need to be defined

For example

TERMINAL OBJECTIVE

The student will be able to analyse the pattern of industrial location of iron and steel industry of Western Europe and the U S.A

COMPONENT OBJECTIVES

Locate iron ore, coal and limestone areas of western Europe and U S.A.

List the factors affecting the location of iron and steel industries

Describe the growth of iron and steel industry in Europe and U S A.
Identify the factors affecting the location of industries which have operated in the industrial pattern of Western Europe and U S A

Information needed to introduce the concept
Iron and steel production requirements of raw-material site, situation
Factors preferred for location of heavy industry.
Types of ancillary industries dependent on iron and steel industry.

It is clear from the above example that if the entry information was taught before the test and the component objective were tested during course work the achievement of the terminal objectives would be improved

Evaluation—Terminal Objectives

The evaluation of entry skills before starting instruction minimises the low achievement which usually results when terminal objectives are not used The use of such assessment data for the teacher is mainly to

(i) planning instruction by deciding whether the basic facts and skills need to be reviewed by home work or class work or retaught
(ii) replace terminal objectives—given the actual the requisite information certain terminal objectives may be difficult to achieve and therefore be dropped
(iii) decide placement of learners—depending on the level of the entry skills known the teacher can place students into groups for 'pacing' the instruction programme right in the beginning of the unit

Terminal Objective

To compare the processes and products of landscape formed by wind and ice as agents of erosion

To plan instruction to achieve this objective there is need to decide what facts and skills are required. The information input on the types of depositional and erosional features formed by wind and ice, the processes of abrasion, deflation, scouring and deposition are to be provided. This is to be followed by instruction which not only illustuates these features with photograph but provides experimental evidence on how the processes operate. Instruction would involve the listing of the stages in the formation of the landscape and the type of action by the agent.

It is, only after such instructional input that a question of comparing the processes and products of wind and ice eroded landscapes is possible. Further the testing situation could be selected from one in which the feactures formed are compared in terms of external characteristics It could also be attempted to identity whether the features have been formed by the same process of wind or water denudation (e.g deposition) and compare the products that are formed The wide variety of situations that are found for testing indicate that if teaching adheres to the objective, testing stituations automatically present themselves.

Evaluating the component objectives

The use of end of the class questions, home work, and short unit tests are common means of evaluating the component objectives of the unit.

The preparation of tests on the component objectives like short unit tests are common means of evaluating the component objectives of the unit

The preparation of tests on the component objectives require that all the objectives are evaluated and immediate feedback to the learners provided.

In the following example the type of question which can be used for component objective evaluation for feedback are shown as distinct from those for terminal objectives

Terminal objectives

Explain the formation of clouds and identify their types Continuous evaluation by

- naming clouds shown in pictures
- experiment in making hot water condense
- true/false test on cloud formation process
- assignment on clouds and their types based on source materials

Terminal objectives evaluated by using questions

— on clouds characteristics.
— on recognition of types of clouds
— talk on cloud formation

Terminal objectives evaluate the final products of learning whereas the process objectives, based as they are on the learning method evaluate the quality of learning how rather than what

For example process objectives like the following

(i) Observes the weather conditions and particularly notes sky condition for a month during June-July (monsoon Period)

(ii) Classifies the sky condition into categories according to cloudiness and windiness.

(iii) Derives a tentative prediction system for the next day's weather

(iv) Verifies the prediction on the basis of weather data collected or observed

The above process objectives are not such that a single question can be used to test the learning. The process being followed by the learner, the accuracy of the data collected the method used for classification is evaluated continuously using both questions or just observation

In the process of defining objectives for evaluation it is crucial that not only should validity, reliability and objectivity be maintained but the use to which the evaluation is to be put determined, since the design of the evaluation scheme affects the nature of decisions that can be made

The purpose of teaching is to change pupil behaviour (intellectual, emotional and physical) in desired directions The desired directions are the educational objectives established by the society Evaluation is the process of determining the extent to which these objectives are being achieved. The interdependence of these 3 facets of education is recognisable in the following steps included in the educational process

The first step in both teaching and learning evaluation is that of determining the learning out-come to be expected from instruction What kind of learning product is being sought? What knowledge, understanding, skills should the pupil possess? What interests and attitudes they should have developed ? What changes in habits of thinking, feeling and doing should have taken place? It is only by identifying objectives and stating them clearly by either placing weightages or assigning ranks according to the complexity of specific behaviour can we provide direction to the teaching process and prepare for systematic evaluation of learning outcomes

There is need to plan at this stage which course content and teaching methods are integrated into planned learning experiences, so that pupil behaviour will change in the desired direction, the emphasis is on the process rather than the product of learning Unless the planning and directing of learning experiences is preceded by a clear statement of product objectives which is verified ensuring evaluation of pupil progress, it is not possible to determine the effectiveness of these planned learning experiences

The next step is concerned with the how of evaluation. How do we select situation to show desired changes in behaviour? How do we choose the most appropriate evaluation method? How do we construct or select specific evaluation tehcniques? How do we interpret and apply the results?

Evaluation of pupil progress is regarded as being essential for the benefit of teachers and administrators. This step contributes directly to improve pupil learning in a number of ways. Evaluation procedures help to clarify for the pupil what does we wish him to learn. They help him to recognise areas of learning difficulty They indicate both for the pupil and teacher, his readiness for future learning activities In fact they act as guides for selection of learning experiences and placement of pupils in special groups Evaluation procedures provide the information on which to base administrative decisions concerning the placement grouping and promotion of pupils

Towards Defining Objectives

The defining of objectives and using a specific approach is the first step in preparing an evaluation design It is not enough to define a set of expected outcomes which sohisticate but these must be capable of being followed for instructions Instructional sequence, content, methodology and evaluation strategy must be evident from these objectives. In the following examples there has been an attempt to try and define of objectives not only for primary, secondary and senior secondary stages using a specific set of assumptions for each classification.

The assumptions here are that at the primary stage the purpose of instruction is to develop abilities of observation, senses of also manipulation both manual and using graphical and numercial units.

Further these objectives are based on the understanding that the knowledge information input is environment based i.e , on direct experience in the child's life at the primary stage, related to the generalisations and relationship between spatial and temporal aspects at the secondary and higher secondary stages. The input of graphicacy is however more measurement and counting based at the primary, map reading and depiction of information on maps, interpreting patterns at the middle stage and map making, sketching from actual landscapes surveying at the secondary and senior secondary stages

In accordance with such an organisation of subject matter the objectives' second component, the behaviours have been listed It is being pointed out that these are only suggestive and a teacher or school can definately use these objectives at any stage or select a few from each approach. The assumption regarding the objectives are that the primary stage where enviornment based instruction (Model A) and the child is coming to terms with how to collect geographical information and recognise spatial variations as seen in the surroundings, using the information should be the main instructional priority The objectives therefore are observation which involves recognising, relating, naming and identifying objects in the environment around These are then classified according to given basis, counted and measured for purposes of identification and classification by which relationship can be interpreted Explaining, giving reasons for the relationship and being able to distinguish between spatial and developmental changes and sequences is the next level. This is followed by elementary level interpretation, experimentation, verification and prediction of effects or results which one observable in and around the environment but not explained. At this stage since expression is mainly oral and graphic the ability to communicate is also included to cover the development of both manual, visual and aural skills

In the objectives as have been defined for the secondary stage (Model B & C) the objectives that have been taken are those identified by researchers as product objectives. Knowledge, Understanding, Application and Skill (Bloom, NCERT) Now very commonly used in schools here, those objectives are really what the learner should be able to do as a result of instruction. These objectives are such that they can be observed in the assignment and activities performed by students when given a specific task

Example:

(1) Understands the interdependence of resource and industrial development.
This is very generalised and cannot be evaluated directly but only from a series of assignments based on localisation of industry

(2) Compares the factors that affect the location of the iron and steel and the aluminium industry.
This is more observable but the points of comparison can be many and be identified as similar in that these are energy based or that one is raw material based whereas the aluminium industry is power based

(3) Gives the conditions which cause the concentration of iron and steel industry and dispersed location of the aluminium industry in the USA

This outcome is directly observable since the specific condition is defined and the facts available permit an explanation to be given that the input of raw material results in the concentration in port areas and power decides the location of the aluminium industries in Tenneesee and Texas

The outcomes in terms of products of learning are organised here in a heirarchy based on the complexity of the process involved. The behaviours is supposed to be necessary for the next level such that the objectives of analysis and application are based on information which in turn has to be known

The definition of objectives in the Third Model C is based on a logical organisation by which information can be processed The steps involve the selection of ideas from given communications, developing hypothesis and verifying these logical experimental or analytical procedures. The selection of these objectives of critically thinking have been made for the senior secondary stage here, this is because of the peculiar condition in India where a curriculum allows for the development of these objectives only at this stage because of the type of explanations given in the textbooks.

The objectives are those of selecting a problem which requires selecting the information to explain a problem and evaluating the information to find out what conclusion can be drawn The following are illustrations of some of thses objectives

Example: Objective—selects relevant problem

1. Given information regarding location, monthly temperature and precipitation of a region explanation regarding which of the given problems can be made Mark a (+) against the relevant one

— Type of crops grown in each season.
&#43; Variations in temperature and effectiveness of precipitation
—Similarity in climatic characteristics all the year round.
&#43; Effect of temperature on precipation type and seasonality.
—Factors affecting the temperature and precipitaion of a place

2 Objective Evaluates information pertinent to a problem How does it happen that the annual temperature range in tropical humid climates is low (6°C) but diurnal range in high (10°C)Mark with (+) the statement/s that answers this problem.

— desert areas resulting in less radiation
&#43; uniform insolation every day because of sun's position over head
&#43; clear skies and dry calm air at night
&#43; moderating influence of maritime air masses and winds
— equal length of day and night

As is illustrated in these two examples critical thinking requires the learner to tackle information by reasoning and verifying The thinking involved is logical and the method is that of any systematic analysis One must, of course be careful that in maintaining the rigour of a method the content of geography is not lost

The need to define objectives is linked with the systematic and sequenced teaching of content and its evaluation. Approaches for defining objectives can be the process of thinking, the results of using information or the method of processing information The learners requirement dictates the choice, as in geography where the immediate environment is the content input the use of information immediately available is a good choice for defining the instructional objectives Where the content becomes information and requires a knowledge of other areas and spaces the behavioural outcomes easily achieved is the use of information, its application in hypothetical or unique situations When independent study is expected, critical thinking objectives are useful

However, the teachers success with any of these approaches is the main factor for selection and whichever the approach, the content input must be carefully analysed to get the best results.

Instructional Objectives from Class I-XII of Geography

MODEL-A

Objectives and specifications of Environmental Studies (Social Studies) for Classes I-V (Primary stage)

1 0 **Observation:** The development of the ability in children to explore the world around them with a specific purpose Recognise and identify objects so as to find relationships between new and observed facts using all their senses This process does inclucate a sense of personal satisfaction in knowing and exploring the environment through direct experience

1 1 The pupil recognises the properties of objects and phenomena using the senses of sight, sound, taste, smell and touch

1 2 recalls the properties of objects from previous experiences

1 3 identifies objects, events and changes occuring in the environment

1 4 distinguishes objects on the basis of their properties develop a habit of noting minute differences in the properties of objects and phenomena

1 5 voluntarily seeks new information about the physical and social environment.

1.6 develops curiosity to see new objects

2.0 **Classification:** The development of the ability in children to discriminate order, arrange sequence, observations and events using given or chosen criteria in order to compare phenomena. This process develops an awareness of the diversity of systems and the importance of ordering to interpreting phenomena

2 7 The pupil describes differences between objects and phenomena on the basis of given or chosen criteria

2 8 distinguishes between objects and phenomena on the basis of similiarity and differences

2 9 orders objects on the basis of one or more criteria

2 10 identifies and names properties which could serve as the basis for classification,

2.11 appreciates that there are several different ways to group objects and events

3 0 **Counting and Measurement:** The development of the ability in children to identify the prupose of measurement select which type of measurement would serve the purpose and how the measurement is to be taken and recorded in order to make inferences about relationships between variables in the environment

3.12 The pupil identifies sets and their members
3.13 compares areas and masses of different shapes.
3 14 demonstrates measurement of length, area, volumes, time, temperature and vasluce using relevant instruments.
3 15 orders numbers
3.16 determined number relationships
3.17 distinguishes differences between estimation and measurement of objects and phenomena
3 18 selects situations when measurement and estimation are to be used for determining length, weight, area distance, size
3 19 compares measures and makes inferences about the variables
3.20 designs tables for recording data
3 21 prefers to be accurate in measurement.
3.22 appreciates the need to measure for interpreting relationships between phenomena.
4 0 **Using space time relationship:** The development of the ability in children to identify the relationship in the social and physical environment between movement and time, and the changes that occur in time and over space of social and physical processes
4.23 recognises objects in relation to other objects.
4 24 identifies direction and movement of objects in space.
4.25 interprets trends and changes of environmental phenomena over space and in time
4 26 compares changes in the spatial position and relationships between physical and social phenomena over time.
4.27 develops tentative generalizations to explain changes of social and physical phenomena over space and in time
4.28 appreciates the dynamic nature of natural and social systems, develops awareness of the diversity and constant change of social and physical processes
5 00 **Experiment and Investigation:** The development of the ability in children to identify the relation ship between variables infer cause-effects, relationships and deduce conclusions derived by investigation and experimentation
6.40 The pupil
organises data efficiently.
6.41 recognises central themes/issues and assumptions
6 42 compares trends and patterns of observed phenomena
6.43 infers relationships between phenomena
6 44 establishes relationship between variables
6.45 suspends judgements till adequate data is available.
6 46 forms a habit of systematic enquiry
7 0 **Generalizing and Predicting:** The development of the ability in children to formulate generalizations, draw conclusions verify facts and predict consequences on the basis of analysis and interpretation The appreciation of using enquiry to form hypotheses and critical judgement of evidence are an outcome of this process
7.47 The pupil
deduces relationships between variables
7.48 verifies conclusions with further evidence

7 49 extrapolates trends/implications, assumptions based on obtained data and previous knowledge

7 50 derives principles on the basis of relationship between variables

7.51 appreciates the need to revise options on the basis of available facts

7.52 supports ideas and arguments with sound and logical arguments.

8 00 **Communicating:** The development of the ability in children to express through writing speech and action relevant observations, conclusions and arguments The requisite skills to understand and use information by development of the skills to read, listen, see and locate information effectively

8.53 The pupil uses relevant new words, sounds, actions tools and instruments correctly.

8.54 translates observations, conclusions into suitable means of expression

8.55 describes objects phenomena, trends, experiments procedures, through words, sounds, drawing, writing and demonstration precisely.

8.56 locates relevant sources of information from the environment

8 57 voluntarily participates in group activities.

8.58 willingly shares ideas and accepts others' arguments and ideas.

Instructional Objectives of Geography at the Secondary Stage VI-X

OBJECTIVE

MODEL-B

The pupil

I acquires knowledge of facts, events, terms, concepts, principles, generalisations, hypotheses, problems methods, trends, symbols, tools, teachniques, processes, etc. concerning geography

II understands terms, concepts, principles, generalisations, trends, symbols, processes, etc

III. applies the acquired knowledge and its understanding to unfamiliar situations.

IV. acquires skills related to the study of geography

V develops interests related to geography.

VI. develops positive attitude towards peoples and environment

SPECIFICATIONS

I. Acquisition of knowledge

The pupil

I 1 Recalls facts, terms, concepts, principles, processes, etc.

I 2 recognises facts, terms etc
I 3 indicates information on map, charts, diagram etc
I.4 reads information represented in various forms such as maps, charts, diagr graphs, tables, etc.

II. Understanding

The pupil

II 1 translates from one form of communication to another
II 2 distinguishes, discriminates or differentiates different facts, terms, etc
II.3 compares
II 4 contracts
II.5 classifies
II 6 arranges in a particular manner (order)
II.7 explains (gives meaning, elucidates or clarifies)
II 8 summarises
II.9 cites illustrations
II 10 detects errors
II.11 rectifies errors
II 12 identifies relationship between ends-means, causes-effects, etc.
II 13 extrapolates beyond some given data or communication
II.14 intrapolates simple gaps in data
II 15 interprets data (information) presented in various forms
II 16 identifies underlying assumptions

III. Applications

The pupil

III 1 analysis the situation to identify the problem
III 2 selects relevant knowledge (facts, principles, etc.) to explain a new situation or to a problem.
III 3 judges adequacy, relevance, essentiality, verifiability etc of data or any evidence
III.4 recognises (restructures) the material in a new situation
III 5 establishes relationship.
III 6 formulates a hypothesis
III 7 verifies (checks the consistency of) hypothesis
III.8 draws inferences
III 9 generalises principle
III.10 predicts outcomes in a given situation

IV. Skills

The pupil

IV 1 draws maps, charts, diagrams, and other such graphical forms to depict geographical information
IV 2 prepares models, tools, apparatuses, etc
IV 3 handles tools, apparatuses, etc
IV 4 preserves specimen and other exhibits of geographical significance
IV 5 handles and displays material of geographical significance
IV.6 makes observations accurately

V. Interest

The pupil

V.1 reads literature related to geography
V.2 collects geographical information from books, newspapers, etc
V 3 desires to know about life and activities of people in different parts of the states, the country and the world
V.4 participates in the activities of the school geographical circle such as tours, execussions, etc
V.5 collects articles of geographical interests such as as specimens, pictures etc.
V 6 advances relevant geographical reasons, explain various human activities and natural phenomena
V.7 observes geographical phenomena keenly
V.8 visits places of geographical interest
V 9 pursues hobbies related to the study of geography, such as modelling, photography etc.

VI. Attitudes

The pupil

VI.1 recognises the contribution made by various regions and peoples to the growth of modern civilisation
VI.2 recognises the significance of interaction between man and his environment.
VI 3 realises the importance of inter-dependence at various levels among states, countries, regions, etc
VI.4 shows fellow-feeling and sympathy for groups of people other than his own in his country or outside
VI.5 considers national problems in international context.
VI.6 realises the importance of the conservation of natural resources.

Instructional Objectives in Geography for the Senior Secondary School Stage
(+ 2 stage)

Objective

MODEL-C

1.0 To acquaint the pupils with the fundamental KNOWLEDGE of facts, concepts, principles, processes, trends, classifications, criteria, methods, techniques,,generalizations, theories.

2.0 To enable the pupil to UNDERSTAND the inter-relationships of geographical elements, concepts, principles and processes

Specifications

The pupil

2.1 translates technical terms and abstract ideas into more concrete statements

2.2 translates symbols, maps, illustrations, tables, diagrams and graphs to verbal form and data maps, diagrams, illustrations, tables and graphs.

2.3 gives illustrations or examples of general principle or generalizations

2.4 sees the accuracy of given information for explaining a phenomena or generalizations.

2.5 interprets various types of statistical and symbolic data

2.6 identifies the inter-relationship of facts in a generalization and conclusion

2.7 explains the impact of principles, laws and processes on phenomena

2.8 infers and draws conclusions and predicts trends from a given statement

Objective

3.0 The pupil is able to think about the geographical issues CRITICALLY on the basis of available information.

Specifications

The pupil

3.1 applies generalizations and principles in geography to solve actual social problems

3.2 uses techniques of data collection and maping to find information for studying geographical phenomena

3.3 infers the implications of physical, economic and social conditions in a region.

3.4 recognises unstated assumptions in a given explanation or discussion.

3.5 distinguishes references, generalizations, conclusions and principles from facts which support them.

3.6 discerns and states meaningful patterns and generalizations
3 7 distinguishes cause-effects relationship from sequential relationships.
3.8 analyses the inter-relationships among ideas in a statement
3.9 suggests the best procedure for obtaining information about a geographical principle
3.10 produces a field study plan which includes an infered organizing principle
3 11 developing criteria to judge the accuracy, consistency and details of information and utility of statements, maps and descriptions

Objective

4.0 The pupil develops SKILLS in
4.1 drawing plans, diagrams, maps, graphs, projections;
4.2 manipulating instruments;
4 3 collecting, organising, and proceeding data collected and available in maps and toposheets;
4.4 reporting geographical information, evidences, and results using scientific terminology
4.1 drawing plans, diagrams, maps, graphs and projections.

Specifications

The pupil

4.1 1 draws plans, maps, etc. of observed or given information accurately
4 1.2 recognises the properties and uses of different techniques of mapping, projections, maps and surveys.
4.1.3 labels, maps and survey plans.
4.1.4 draws plans, maps, graphs and diagrams neatly at a reasonable speed.
4.2 Manipulates instruments.

Specifications

The pupil

4.2.1 arranges instruments systematically in the field.
4.2.2 handles survey and weather recording instruments properly.
4.2.3 reads instrument correctly and accurately.
4.2 4 maintains instruments appropriately
4.3 Collects, organises, processed data available through surveys, field work, topographical sheets, weather maps and socio-economic maps.

Specifications

The pupil

4 3.1 selects suitable instruments for surveying and suitable cartographical and statistical techniques for field-work and mapping
4.3 2 gathers the required data from suitable sources for survey, field work and for mapping
4 3 3 uses relevant statistical and cartographic methods and projections to depict the data, map radials, and survey plans
4.3 4 detects errors in the method used for surveying and properties of projections, linear, radial and volume symbols used
4.4 Reporting geographical information, evidence and results using scientific terminology.
4 4 1 makes use of appropriate geographical terminology in describing the maps, plans, topographical sheets and weather maps.
4 4.2 sifts the relevant information for a purpose effectively.
4 43 refers accurately to grid references, scale, and patterns of geographical informations.
4 4 4 studies correctly the tables and scales of map to collect the required information
4.4.5 organises the report and interpretations in a clear, precise and consistent manner
4 4 6 records the evidence in appropriate manner
4.4 7 summarises the conclusions systematically

Objective

5.0 The pupil develops INTEREST in Geography

Specification

The pupil voluntarily

5.1 observes geographical phenomena keenly.
5.2 collects specimens, data, picutres, etc. of geographical interest.
5.3 reads literature of geographical interest.
5.4 participates in the activities of school geographical society
5.5 visits places of geographical interest
5 6 contributes exhibits of geographical nature to school museum.
5.7 writes articles, news items, etc on topics of geographical natures
5.8 discusses matters of geographical nature in his group.
5.9 tries to know about the inhabitants of different areas.

Objective

6.0 The pupil APPRECIATES the geographical phenomena on the earth and the role of geography in studying world regions

Specifications

The pupil

6.1 realises the significance of environmental studies in the context of man's activities
6.2 recognises the contributions made by various persons toward the growth of geographical knowledge
6.3 is conscious of the significance and need of human efforts to overcome the barrier of nature
6.4 recognises the contribution of different regions and people to the growth of civilization

Objective

7.0 The pupil
7.1 realizes the necessity for optimal use of the natural resources
7.2 realizes the necessity for a rational, scientific outlook for economic growth
7.3 realizes the need for controlling population
7.4 believes in the interdependance of communities, nations and regions
7.5 has a sense of belongingness to community and country
7.6 judges issue in a broad contest
7.7 possesses a sense of healthy patriotism

7.8 is open-minded to new ideas
7.9 has respect for the ways of living of other people.
7.10 values the pursuit of excellence
7.11 belives in man as an important agent of change
7.12 arrives at judgement after appropriate evidences
7.13 considers the growth of civilization as the result of combined effort of the entire mankind.

CHAPTER III

Using Objectives for Teaching and Testing

The definition of objectives is in the context of the use to which these are to be put has been indicated previously Their use for diagnosing or comparing pupils learning with final expectations are the main considerations when defining the objectives and using them

There are a variety of terms used for the planning of teaching, like units, modules, events, episode, resource unit, lesson plan In all these methods of analysis of content such planning is necessary because in teaching geographical content there is

(i) a central theme
(ii) variety of information to be known for learning further
(iii) content to use for extending application to field studies
(iv) scope for development problem-solving abilities

When developing a unit for teaching and testing the stages in planning are

I Defining units objectives
II. Introducing the unit
III. Content Analysis and specifications
IV Formative and Terminal Evaluation Plan.

I. Defining Units Objectives

The need to define objectives is obvious enough to a teacher faced with the problem of deciding what to teach and why to teach the content. Here in planning for using objectives the attempt is to define these objectives in terms of the expected learning by the student, after instruction, in relation to the goal of learning identified

Following are illustrations of certain goals and related learning objectives to clarify the above statement

Illustration

I *Goal* : To understand the effect of vertical and horizontal earth movements in mountain building

Learning objective

(a) Given pictures of the rock structure of folds and faults describes the stages/processes which lead to their formation and locate one mountain system of each type on the given world map.

(b). Compares the difference in the process by which mountains are formed by folding and faulting

Illustration

2. *Goal*: To apply the theory of location of industries to identify the patterns of industrial location in the world.

Objective

(a) given a set of hypothetical diagrams showing distribution of raw materials and markets *locates* the site of an industry which is market-centred.

(b). given a pattern of industrial location of N.E. United States of America explains and illustrates the principle of least cost. At the elementary stage the objectives can be defined as given here

Illustration

3. *Goal*. To identify the factors affecting the patterns of industrial location in the world.

Objective

(a) Given maps showing the distribution of industries in Europe and U.S.A. and the mineral resources distribution pattern, gives reasons how the availability of raw materials affect the location of industries

(b). Using the pattern of distribution of industries U S.A , illustrates the principles of

(1) least transport cost location
(2) raw material based location
(3) market based locations.

In the above two examples it is seen that the learning objectives derived from the same goal can be very different from each other depending on the learning outcomes expected

Then writing the learning objective for any unit of instruction the effort should be to

1. state exactly what the learner is expected to do.
2. define how the learner will demonstrate this achievement
3. determine what level of performance can be taken to represent an acceptable level for the individual and the group.

For example in the following set of 4 objectives the standards are definitely at different levels but related to the goal of critical evaluation

(a) State the social, political and economic factors which affect the growth of cities.
(b) Apply the principles of the spontaneous growth of modal centres to identify the causes for the suburban growth.
(c) Analyse the causes of spontaneous growth of residential and commercial areas in industrial townships and their effect on city ecology.
(d) Design a proposal of land use keeping in view the requirements of industrial workers for a hypothetical city.

Similarly an example is seen in the following definition of objectives.

(a) Compare the factors which contribute to the diversified agriculture in Western Europe and the single crop cultivation in Central Europe
(b) Give examples from European Economy to illustrate the trend that with industrialization agriculture tends to diversify

(c) Analyse the cause for the varying levels of agriculture and industrial development in different parts of Europe
(d) Propose the outcome of developing only agriculture and not industry in a region.

In both these examples the first is simple and requires a learner to accomplish for less than (b), (c) or (d) objectives. (b) as compared to (c) and (d) objectives required the learner only to identify the causes by applying known principles, whereas (d) requires a original proposal of to be made

4. *Goal*. A similar example from the area of physical geography is to identify the processes of erosion and deposition of glaciers and wind

(a) State the main methods of erosion, transportation and deposition similar and unique to aeolian and glacial processes.
(b) Compare the physical characteristics of depositional features like terminal moraine and dunes and contrast the process of their formation.
(c) Explains the absence of striations and rounded rock and debris in the features of erosion formed in early stage deserts and glaciated areas.
(d) Can trace the nature of erosion and deposition given travelogue, description of physical features found in deserts and glacial areas

At the elementary stage also different levels of stating objectives can be attempted like.

5 *Goal:* To conclude the causes and consequences of volcanoes and earthquakes as environmental hazards

(a) Lists the different types of volcanic eruptions that occur explosive, intermediate and quiet
(b) Compares the type of volcanoes that are formed by violent and quiet eruptions
(c) Identifies the differences in the formation of shields and volcanic mountain.
(d) Suggests environmental problems in the uses of volcanic area which are mountains and plateaus with suitable examples from the world.

It is clear that defining objectives is the first step in planning instruction and evaluation. The designation of the ability, content situation, and expected standard of performance helps define the content input and text situations which are derivable The analysis of content and instructional objectives given in the following examples from physical and general geography are illustrations of this.

Learning objective

1. (a) Given pictures of the rock structure of folds and faults *describes* the stages/processes which lead to their formation and *locates* one mountain system of each type in the given world map
   (b) *Compares the difference* in the rock structure of mountains formed by folding and faulting

2 *Goal:* To apply the theory of location of industries to identify the patterns of industrial location in the world

Objective

(a) given a set of hypothetical diagrams showing distribution of raw material's markets *locates* the site of an industry which is market centred.

(b) given a pattern of industrial location of N E. United States of America *explains* and *illustrates* the principle of least distance to raw material

In the above two examples it is seen that the learning objectives derived from the same goal can be very different depending on the learning outcomes expected.

When writing the learning objective for a unit the effort should be to

a. state exactly what the learner is expected to do
b. define how the learner will demonstrate this achievement
c what level of performance can be taken to represent an acceptable level

For example in the given set of 4 objectives the standards are definitely at different levels but related to the goal of critical evaluation

a State the social, political and economic factors which affect the growth of cities
b Apply the principles of the spontaneous growth of nodal centres to identify the causes for the suburban growth
c Analyse the causes of spontaneous growth of residential and commercial areas in industrial townships and their effect on city ecology.
d. Design a proposal of land use keeping in view the requirements of industrial workers for a hypothetical city

The first is simple and requires a learner to accomplish for less than b c. or d objectives. B as compared to c and d objectives requires the learner only *to identify the causes* by applying known principles, whereas d requires an orignal proposal of urban land use to be made.

A. similar example from the area of physical geography is

a State the main methods of erosion, transportation and deposition similar and unique of aeolian and glacial processes
b Compares the physical characteristics of depositional features like terminal moraine and dunes and contrast their process of their formation
c. Explains the absence of striations and rounded rock and debris in the features of erosion formed in deserts and glaciated areas
d. Can trace the nature of erosion and deposition given travelogue description of physical features found in deserts and glacial areas

It is clear that defining objectives is the first step in planning, instruction and evaluation The designation of the ability, content situation, and expected standard of performance helps define the content input and test situations derivable clearly. The analysis of content and instructional objectives given in the following examples from physical, general and practical geography are illustrations of these ideas

Examples

I. Illustrative Instructional Objectives and sample questions in Physical Geography for the Higher Secondary Stage

1 0 KNOWLEDGE

1.1 Knowledge of facts hardness, texture and minerals, earth's crust, soil support, vegetation, weathering, weather features of glacial, a colian and fluvial landscapes, soil characteristics, soil controls, airmasses clouds.

6 *Illustrative Question*

Coarse grains and the presence of quartz distinguished which of the given rocks from the others?

A Quartizite
B Limestone
C Schist
*D Granite

1 2 *Knowledge of terms* inclination, parallelism, meridians, notations, low and high latitudes, advection inversion, heat budget, lapse rate, adiabatic rate, instability, precipitation, rainfall source region, surface of discontinuity, runoff, evapotranspiration, discharge zone, of situations, ground water, continental shelf, slope

1 3 *Knowledge of classifications* rocks, soil, winds, airmasses, precipitation types, climates, marine deposits, vegetation, relief

1 4 *Knowledege of concepts* Isostasy, Water table, Porosity and Permeability, Tides, peneplanation, Cycle of erosion, Jet Stream, Cyclogenesis

1 5 *Knowledge of trends* . January and July—Average Temperature distribution Vertical and Horizontal Pressure distribution, Runoff regimes

*Indicates correct answers

1 6 *Knowledge of processes* Soil formation in different climate climaxes, fluvial, aeolian and glacial processes of erosion, transportation and deposition, processes of the hydrological cycle, processes, of earth movements and formation of mountains platesus, plains, processes of airmasses, fronts and disturbances

7 *Illustrative Question*

The movement of tension on rock layers causes faults which are termed

*A. normal
B thrust
C strike slip
D reverse.

1 7 *Knowledge of principles* · conservation of earth's heat, deflection of planetary winds, convergance and divergence of airmasses, development of water tables, wave motion, occurence of currents, production of tides, channel development

8. *Illustrative Question*

Why do mountain ranges have a mass of sedimentary rock with height above below 9000 to 15, 200 metres of sedimentary rocks, not more nor less?

1 8 *Knowledge of theories* Continental Drift, Origin of the Earth, Slope development, Monsoon systems, Island formation, Sea Floor Spreading.

9. *Illustrative Question*

It is assumed that owing to the deposition of sediment and smearing down of landforms there occurs an equilibrium between the earth's

A Mantle and care
B Crust and Mantle
C. Sima and sial
D Mantle and sima

2 1 Translates from abstract to concrete the illustration of the concept of graded river profile, definition of the term orogeny and epeirogency, explaining the phenomena of an artesion wall and spring well, illustration of the theories of subsidence and standstill to explain formation of coral reefs.

Illustrative Question

10 Which of the following represents the best description of graded profile of a river?

A. attainment of base level
B equal gradation and degradation
C slope with little concavity
D. more gradation than degradation

11 A reef on a wave cut platform which spread outwards and extends deep into the sea forming an at 11 his is evidence of the fact that the

A island has been eroded
B platform has been stable
*C. sinking continues with coral growth
D water flows into the atoll

2.2 Classifies information on the basis of

a given criteria—colour, texture and structure of rocks soils, temperature and rainfall limits of a climate, features of different stages of the various agents of erosion, rocks and landforms.

b. casual and concommitant relationships—distribution of vegetation and latitude, soils and crops, distribution of rainfall and population density, currents and climate

c. generalizations and facts that support them—occurrence of jet streams and pressure distribution, chinook winds and adiabatic heating processes

Illustrative Question

12 What are the characteristics with regard to texture of sediment, mineral composition and process of formation of the rock, of sedimentary rocks like sandstone, limestone and coal.

13. Two different parent materials may produce similar type of soil if both have similar
   A. vegetable cover
   B. climate
   C structures
   D formations.

14. In July and January which areas of the earth have the largest variation from the temperature of the normal average found here?
   A. North west Europe and deserts.
   B. North east Altantic and East coasts.
   C. equatorial highlands and plateaus.
   D. poles and Eastern Siberia.

2 3 Compare and contrast aspects of a given phenomena like distribution of landforms in continents and oceans, features formed by erosion and deposition by different agents like aeolian, fluvial and glacial action, characteristics of drainage on granitic and sandstone topography, temperature and pressure distribution in oceans and continents, salinity, density and movement of water in oceans in mid and low latitudes

Illustrative Question

15. Which of the given continents differs from the others in that there is no backbone of cordilleras (fold) mountains)?
   A Asia
   B. S. America
   C N. America
   D. Africa

16 Contrast the characteristics of relief features formed in the areas with granite and clay lock types.

17 Why is salinity lower in the Bay of Bengal as compared to the Arabian Sea?

2.4.2 Exception to a principles or generalization:
interruptions in a cycle of erosion; pattern of land form distribution in the different continents ; similar latitudes have similar water storing capacity but ground water levels are not the same in the same latitudes. ,

Illustrative Questions

18. The combination of which of the given conditions would retard the occurrence of a mature fluvial landscape?
   1 flat surfaces
   2. frequent high rainfall
   3 permeable surface material

4. sparse vegetation cover
A. 2, 3
B 3, 4
C. 2, 2
D 2, 4

2.5 Identifies the relevance and limitations of data in a given communication for framing conclusion and implications.

Internal structure of the earth has been constructed by indirect inference from observable data of rock types, structure, seismology, formation of continents and oceans inferred from rock structures, rock materials, deformations, volcanic activity; attributed to conventional currents in the mantle; dealized distribution of climates in the different continents.

Illustrative Question

19 Explain with examples the evidence available from rock types and earthquakes which support the fact that continents float on lying ocean floors.

2 6 Gives reasons for the occurrence of a particular phenomena.

low humus content in soils of humid tropical areas; soil belts are similar in the same latitude; aeolian topography has very few physical features; different parallels of latitudes receive different amount of insolation; Isotherms are generally parallel to the latitude. Tropical cyclones are circular in form

Illustrative Question

20. which of the given factors best explains the reason why deep-rooted crops like oil palms grow best on (red) soils?
A lack of humus, leaving and porus texture.
B high humus and nutrients, presence of lime.
C poorly drained soils with loose porus texture.
D. acidic soil water which reduces iron and clay texture.

21. Why cannot easterly winds occur at all latitudes?

22 Why are tropical low pressure cells formed over continents whereas subpolar low pressure cells formed over oceans in the northern hemisphere?

23. Why do tropical cyclones not have anticyclonic conditions accompanying them?

2 7 Detects errors, unwarranted conclusions in a given communication.

Regionally good soils have attracted man to settle down while bad and impoverished soils have caused civilizations to disappear Analyse in the context of modern theories of reclamation and maintainance of ecological balance

Illustrative Question

24. Are these statements correct or wrong?
(1) drop in temperature with increasing altitude is limited by cases when temperature inversion takes place,

(2) atomic bomb explosions affects world weather;
(3) rainbow in the morning gives you fair warning of rainy day;
(4) hot summer means a cold winter will follow

25. To what makes alluvial soils unproductive?
26 Under what conditions does seasonal variation in rainfall occur in areas which usually have two dry seasons located from 40 degree?
27. Why does it get cold at night in hot desert areas?
28. What are the conditions in which tropical cyclones form and in which months do these mostly occur?
29. Shows trends of sea level pressure and wind direction in July or January for the world given bars over land

Illustrative Question

30 Draws contours given spot heights in an area.

2 8 Interpolates gaps to determine trends from graphic representation of data

Application

3 1 Formulates a problem

determination of the structure of the earth from the information available from seismic waves and rocks,

topography of coastal plains and the influence on agriculture and transportation routes.

Isolation received each day at a given place is determined by the angle at which the sun's rays strike the earth, the length of time of exposure to the sun

The water cycle in the atmosphere is a function of moisture transport in the atmosphere, precipitation, runoff and evaporation

Illustrative Question

31 What causes the unstable air conditions in tropical humid climates and large amount of rainfall in the late afternoons

A apparent movement of the sun north and southerward
B convergence of north east and south east trades.
C. waves of easterlies which cause tropical disturbances
D. higher humidity due to low evaporation

32 If the earth's rotation did not affect the winds what would be the direction of surface and upper air winds

33. List all the arguments you can against the idea that the earth is a molten mass covered by a thin layer of rock.

3.2 Analyses data and evidences.

distribution of insolation and its effect on temperature distribution of the earth

air-mass relationship in a cold front concluded front and warm front conluded map showing river capture to identify beheaded stream, wind gap, diverted stream.

Illustrative Question

34. The result of a larger extent of ocean area and uniform distribution of solar energy in the Southern hemisphere in summer results in
   - A equidistant isotherm distribution
   - B higher isotherm gradient
   - C southward concavity of isotherms
   - D concentration of isotherms along shores.

35 When there is a big difference in the temperatures of air masses which come together the formation occurs of
   - A convectional current
   - B front
   - C typhoon
   - D thunder storm

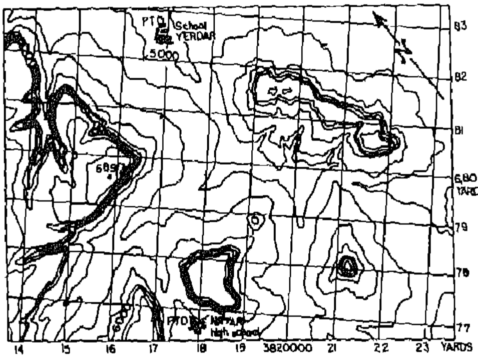


FIG. No 1

36. In these conditions in which parts of the area are the following economic activities likely to be located

	A. *Economic activity*	B. *Area of plain*
B.D	(i) farmlands	A river basin
A.C	(ii) forested areas	B plateau surface
C.D.	(iii) transport routes	C. scarp edge
		D upland areas

3.3 Discriminates between closely related facts.
fluvial topography in the early maturity and late maturity
relative direction of displacement of rock strata in normal faults and reverse faults
highland climates and polar climates
Asiatic savannah climate and African or South American savannah
distribution of high pressure cells in Northern hemisphere and belt of high pressure in Southern hemisphere

a. What characteristic features of the arrangement of landforms distinguishes youthful and early maturity in a fluvial topography.

b. What are the most striking differences in the characteristics of vegetation zonation of highland climates in tropical and middle latitudes

3 4 Estimates to probability or consequences of a particular phenomena
methods of soil conservation in arid and humid regions and effect on agriculture
Glacial, fluvial and aeolian, landforms as a consequence of the methods of erosion, transportation, and deposition
Role of mountains, plateaus and plains in promoting or hindering development or utilization
Airmasses source region and circulation pattern as factors which influence climates of a continent

Illustrative Question

36 a Identify the effect of weathering on Rocks which are massive and fine grained when it occurs in arid and humid climates

37. b Illustrate with examples the possible utilization of hill and mountain regions which are usually considered land unfit for productive use.

3.5 Hypothesises, draws tentative conclusions, probable relationships on the basis of given data,
relationship between vegetation climate and natural animal life in grasslands, equatorial forests, and polar climates.
Relationship between surface irrigation and underground well irrigation in a given annual cycle of soil water conditions of humid climates.
type of weathering in different climates.
suggests the possible process which could have resulted in the formation of features shown on a contour map.

Illustrative Questions

38. Of grasslands and forests the distribution of which of them is over a wider variety of environments and why?

39. What are the conditions which result in runoff not varying directly with precipitation?

40 Which of the given generalizations can be drawn from the study of the role of weathering in soil formation?

   1. Soils produced from different variety of rocks in the same climate will be more alike than the same rock type in different climates.

2 Development of soil profiles is possible only in residual soil material not transported soil material.
3 Soil horizons are formed more because of the Physical weathering than chemical weathering.
4. Chemical influences in the processes of soil formation is due to the interaction of carbon, and plant roots

A. 1,2
B. 2,3
C. 1,4
*D. 3,4

3 6 Selects appropriate methods, procedures, and techniques and tools to collect evidences.
Identifies the physical features of a region shown in a contour map to classify the stage at which the region is in a cycle of erosion
Identifies the data required to classify climates according to the koeppen's classification.

Illustrative Question

41. What are the basis used to differentiate the six groups of climates and the types within them as per Koeppen's classification

3.7 Draws inferences, unstated assumptions, consequences and ramifications of a phenomena.
Glacial topography is limited in area, in distribution and in time. The largest extent was attained during the Pleistocene or great Ice ages
Potentialities of the development of plateaus for minerals exploration
Identifies shorelines of emergence and submergence by studying features as shown in block diagrams.

42. Glacial topography is limited in area, evidence can be suggested to support this fact.
43. What factors result in the uneven distribution of minerals on the earth's surface

3.8 Supports validity of conclusions and consequences drawn from given data or information
Difference in the cycle of erosion of and zones and humid regions.
Laterite soils are more favourable for forests than crop cultivation
Annual precipitation has a limited value as a basis for climate classification.
Vegetation as a basis of climate classification has limitations.
Climate classification combining temperature, precipitation characteristics set to limits and bounderies fitted into vegetation distribution is the basis for koeppen climate classification system.

44. In air over with laterite soils there is more forest than crop cultivation due to the
*A. absence of humus on surface and deep profiles.
B. formation of laterite nodules.
C. presence of iron and aluminium oxides
D leaching and thin soils

45 Which of the given reasons adequately explains why vegetation type alone is not suitable for classifying climates?

A. Terrain and human activity interfere with the development of a vegetation type.

B. Within a region dissimilarity of vegetation occurs

*C. Similar vegetation varieties occur in different climatic conditions

D. Temperature variation do not effect vegetation as much as precipitation

3.9 Organises ideas in a coherant systematic and consistent manner Concept of cycle of erosion in humid and arid regions.

Airmasses circulation and source regions as an explanation for weather changes in different seasons.

The distinguishing characteristics of mountains are steep slopes and high relief What process have contributed to such an arrangement of relief.

4.1 Judges the logical accuracy, consistency and faithfulness of the conclusions of a communication.

Analysis of landforms and slopes on the basis of criteria like relative relief, erosional and depositional features, terrances, types of slopes to judge the soil texture in different areas of the region.

Ocean bottom topography is essentially a ridge and basin topography to be judged on the basis of a study of the ocean bottom topography of the Indian ocean.

46. Using the criteria of arrangements, extent and height and slope attempt to divide the Basta area into physiographic divisions. For the regions identified explain the basis of the scheme:

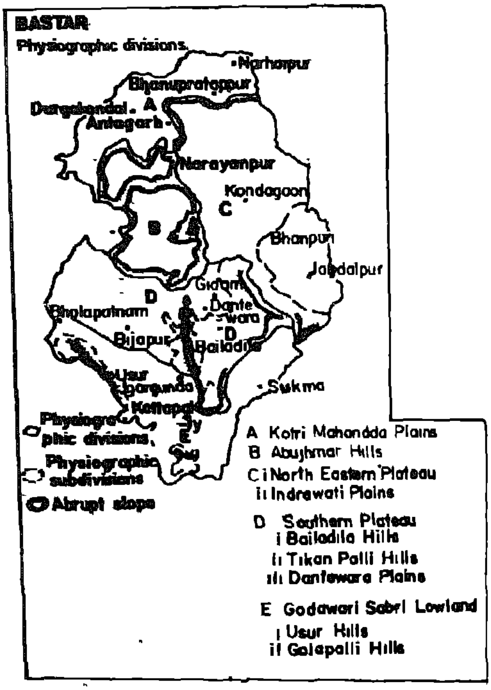


FIG. No 2

II. **Illustrative Instructional Objectives and questions from** *Human and Economic Geography of the World and India* [*General Geography*]

1.0 Knowledge of facts, terms, classifications, concepts, generalizations, processes, methodology trends, sequence, criteria, tools abstrations principles, theories.

1 Which process in the earth's crust contributes to the formation of minerals used as energy resources.

A. folding and formation of compressed rock structures

B wearing down of rocks surfaces and deposition to form rocks from sediment.

*C acumalation of sediment and increase in pressure causing metamorphosis.

D melting, volcanic eruptions and resolidification of magma.

2 The distribution of which resource is such that no part of the earth, even a continent, is entirely self sufficient

*A. minerals

B. water

C vegetation

D. soil cover

2.0 *Understanding*

2 1 Translates from abstract to concrete

The resource value of a mineral can be determined by identifying if it

A. is known how much and where the mineral is.

B. has quality, grade and quantity for small scale use.

C occurs in places near the earth's surface

*D can be used more cheaply than any other substance.

2 2 Classifies information on the basis of

2 2.1 given criteria

2 2.2 causal and concomittant relationship

2.2.3 generalizations and facts that support it.

1. Which of the given minerals is of low economic value and more bulk?

A. Iron ore

*B Phosphate

C Copper

D. Bauxite.

2.2 2 Which resource can be renewed by reproduction or by physical, mechanical or chemical processes.

A. Coal

B Solar energy

C. Petroleum

D. Natural gas

2.2.3 Estimates of the *reserve base* of minerals is of limited use for assessing the extant to which the resource can be used in future because of the fact that

A. only minerals with a future value are considered for detailed survey.

B. survey methods vary for studying different types of minerals.

C. it indicates how much more can be extracted economically at present conditions.

D. only accessible and concentrated deposits are assessed.

2.3 Compares and contrasts aspects of a given phenomena

Which of the given problems is common for abandoning the use of both metalic (iron ore) and non-metalic mineral ores (gy)

A. destruction of the land surface by older mines.

B. non availablility in surface concentrations.

*C. lowering of the grade of the mineral

D. availability of cheapter substitutes

2.4 Gives illustration of exceptions or examples to support a given generalization or principle.

1. The use of wind power instead of fossil fuels for energy in rural areas is an example of the policy of

*A. substituting a renewable material for a non-renewable one

B. using a source abundant instead of a scarcer one

C. saving the mineral resources for better use

D. reduction in extraction and transportation costs

2. Under development is related with low levels of mineral consumption because of *all* of the following *except*.

A. better profits by export of raw material

B. inadequeate knowledge of reserves

C. low levels of technology

D. non availability of a mineral

2.5 Identifies relevance and limitations of data in a given statement for framing conclusions and implications.

From the following data on the "Life time" estimates for known reserve life time (in year)

Aluminium	53
Copper	30
Lead	29
Nickel	18
Tin	34

(Source UN Estimates of World Environment)

Indicate for each statement given below:

A. If according to the facts the statement is true.

B. If according to the facts the statement is false.

C. If according to the facts the conclusion cannot be made.

B 1. There will be a shortage of minerals within the century.

C 2. Certain minerals have reduced in extraction because of decisions taken by countries

A 3. The availability of lower grades of each mineral would increase "Life time".

2.6 Gives reasons for the occurrence of a phenomena

1. For which of the given reasons would there be a decrease in the need for primary mineral raw material like iron ore etc
   A. discovery of more efficient extraction processes.
   B. availability of cheaper low grade minerals.
   C. decrease in the capital available by industry
   D. availability of substitutes

3.0 *Application*

3.1 Delimits scope of a problem
1. Identify two problems of land use resulting from mining activity
3.2 Analyses data and evidence.
1. What arguments are given to support the opinion that there is a depletion of mineral resources in the world?
3.3 Estimates the consequences or implications of a given statement.
1. Assess the impact of continuation of the present practice of extraction of most concentrated, easily accessible minerals.

III. Illustrative Instructional Objectives and Questions from Paractical Geography and Fieldwork

1 The pupil develops SKILLS in drawing plans, diagrams, maps, graphs, and projections by using given information, recognising properties and using different techniques, labelling.

Illustrative Exercises

1 1 On a given topographical sheet using the points of the compass note the compass bearing on the chief features of the district on the map

1 2 Study the symbols shown on the margins of different maps and use them for drawing a map

1 3 In the atlas find the distance in a straight line between Ranchi to Bangalore.

1 4 Measure on the map how many miles the Mahanadi flows through the state of Orissa and Madhya Pradesh

1.5 From the map of India in the atlas state the direction of travel by air from

1. Lucknow to Gwalior

2. Nagpur to Jabalpur

3 Poona to Bangalore

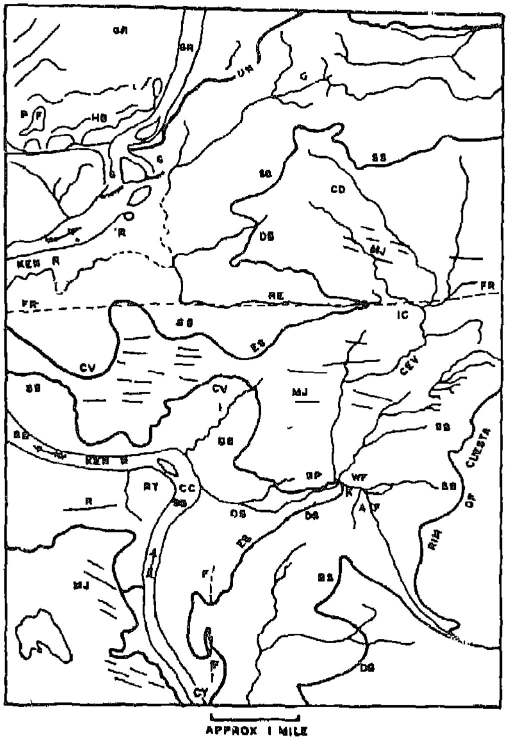
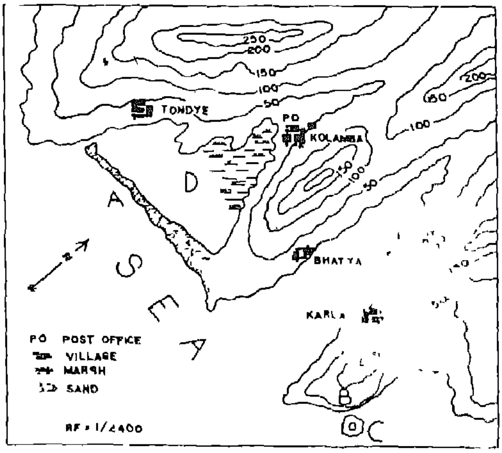


FIG NO 3 Contour lines of a water shed 1 cm-0 6 kms (1"-1 miles)

Redraw the above map on a scale of 1 inch to 2 miles and mark the drainage system of the area



The Bombay Geographical Association

FIG NO. 4 Simple Map Reading Exercises without [illegible] i In the above map trace the outline of the coast.

ii. Mark 3 sites where towns could come up keeping in view accessibility from the sea and to inland areas.

iii. Label the features marked on the map

A (bar) B (Cliff)

C (Lagoon) D (Island)

1.8 Using a scale of 1 cm 625 metres draw a map of 11 cm by 11 cm of a plain area in which there is shown a plain area which has two millages at road junctions and a canal Depict roads connecting the settlements A river is flowing eastward in the southern section draining this area.

2. The pupil is able to MANIPULATE instruments by arranging instruments systematically handling survey and recording instruments, reading instruments and rotations maintains instruments.

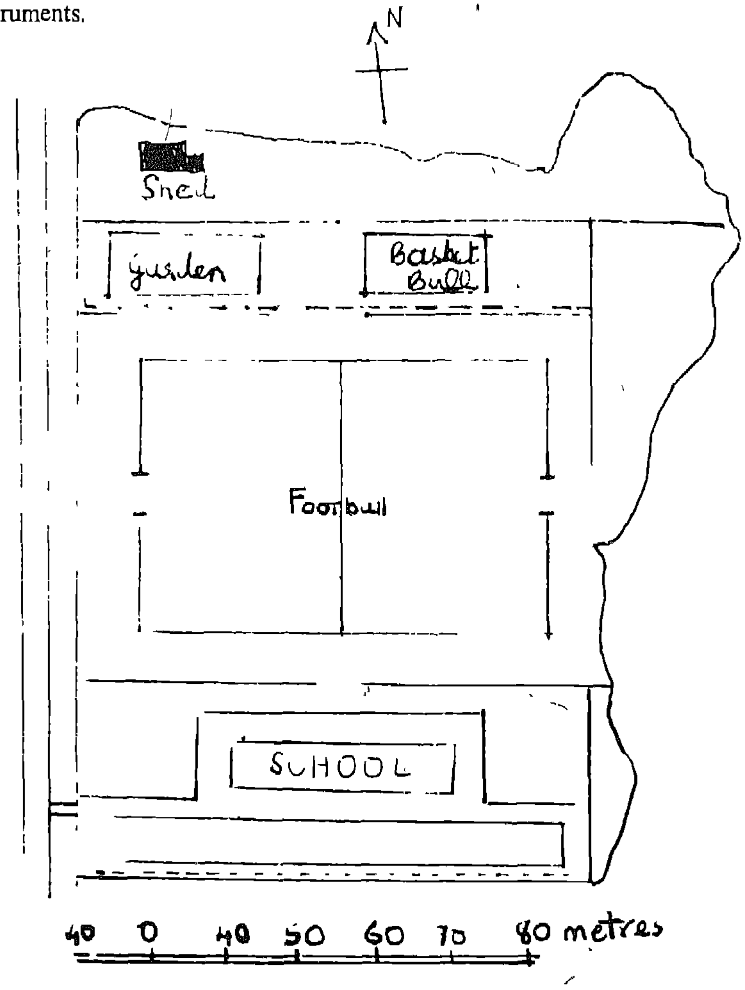


FIG No. 5

Layout of School Playground

Draw a key diagram indicating how to arrange the chains in a chain and tape survey of this area

2.2 Using the above diagram lay the chain lines and collect the measures. Explain how the hedge areas in the north east will be measured

2.3 Using a ordinary spirit level and telescope and levelling staffs undertake a survey of the area shown in Fig 2.1 When taking the measurements note the Back sight, Foresight Rise Fall, Reduced level of the stations

2.4 In an open country choose a base line and undertake a plane table sketch The exercise should require you to

1 Set up the drawing paper and lay the alidade to measure

2 Orient the table at point A

3 Place compass and identify N-8 direction

4 Commence triangulation from A to at least 3 points visible from A.

3 The pupil is able to collect, organise, process data available on topographical maps, weather maps, survey socio economic maps and field work

3.1 (i) Compares the map with the view in a photograph taken from a given spot on the map

(ii) Measure on the map certain landmarks which are visible in the field

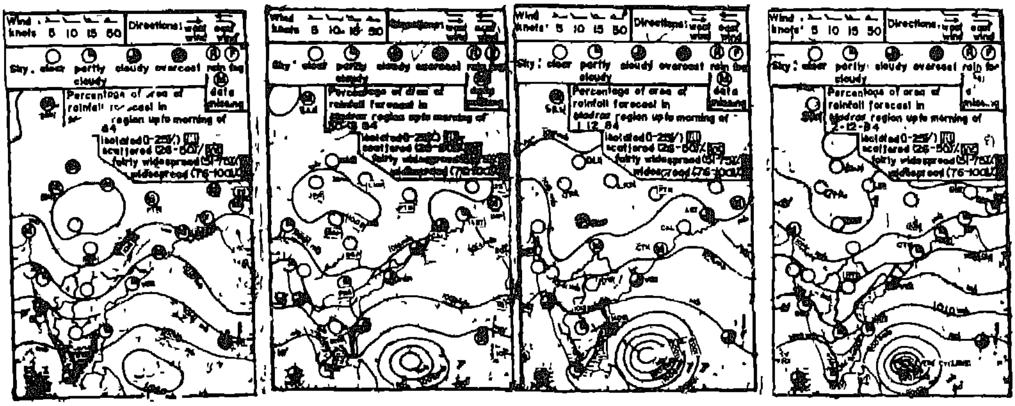
(iii) Enter on the map the boundries, fences walls earth banks that is noticed in the field

3.2 Using the following data of rainfall and temperature draw a rainfall and temperature graph

Buenos Aires

Month	J	F	M	A	M	J	J	A	S	O	N	D	Annual
Temperature ⁰C	23.3	22.8	20.6	16.1	12.8	10.0	9.4	10.6	12.8	15.6	18.9	21.7	16.1
Rainfall cm	7.9	6.9	11.2	8.9	7.47	6.3	5.6	6.3	7.6	8.9	7.9	9.0	9.4

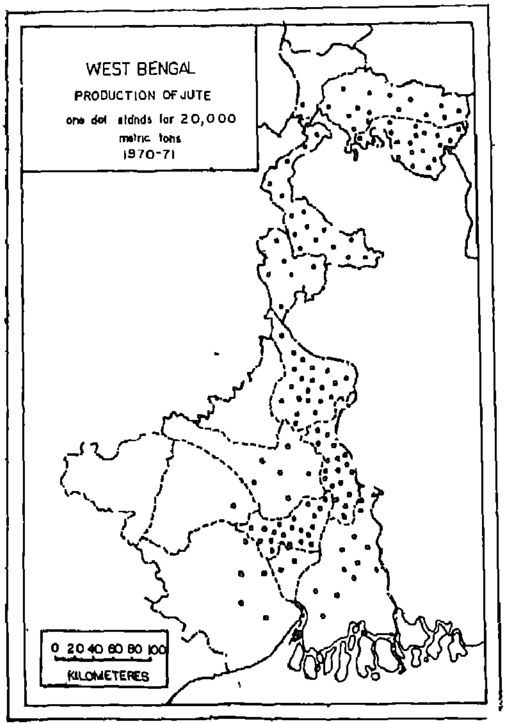
3.3 For the weather reports of November 1985 (Contd on p 40).


Wind knots 5 10 15 50
Directions
Sky: clear partly cloudy overcast rain fog
Percentage of area of rainfall forecast in Madras region upto morning of
isolated 0-25%
scattered (26-50%)
fairly widespread (51-75%)
widespread (76-100%)

©Government of India copyright 1988 Based upon Survey of India map with the permission of the Surveyor General of
The territorial waters of India extended into the sea to a distance of twelve nautical miles measured from the appropriate base line

1 Identify and describe the between of the high and low pressure areas
2 Locate the position and describe the weather prevailing in North West India.
3. Find the average temperature at Delhi, Cochin, Kandla, Vijaywada, Hyderabad.
4. Write a weather report for a T V broadcast of the day's weather.

3.4 In the map showing the production of Jute in West Bengal for 1970-71 Identify the areas where jute cultivation is concentrated and where it is negligible.



Based upon Survey of India map with the permission of the Surveyor General of India

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The territorial waters of India extended into the sea to a distance of twelve nautical miles measured from the appropriate base line

FIG. No. 7

Geography of West Bengal

3 5 The pupil is able to report geographical information, evidence and results using appropriate geographical terminology; sifts information refers to grid, scale and conventional symbols, studies tables and scales of map; organises report; records evidence, summaries conclusions.

1 Change R P. into statement of scale and vice-versa
2 Read distances marked on a given diagonal scale
3. Identity whether data is adequate to interpret and conclude.
4 Sifts information
5. Studies correcting the tables
6 Organises and reports
7. Records
8. Summarises.

III. Content Analysis and Planning the Unit

When a vast amount of information is outlined as is necessary at any given school stage the teacher has to decide which of these have to be used for developing the abilities desirable Obviously certain types of information are more useful for developing certain abilities as compared to others

When analysing the content for selecting what abilities can be best tested using the content, 4 types of information must be provided

1. *Given conditions* Given 6 samples of rocks (slate, shale, granite, sandstone, tale)

2 *Define Action Verb* · (A list of selected verbs are given at the end of the chapter). identifies and labels each rock

3 *Performance condition.* by recording weight, smoothness, hardness, grain size and physical structure

4 *Feedback and reporting information* . Name the types of rocks as igneous, sedimentary or metamorphic

1. *Content Analysis*

The content that are learnt at the school stage can be classified into three major elements concepts, principles and problem solutions.

Concepts are defined as "an abstract idea generalized from particular instance". At any cost in every discipline and particularly geography there are certain unique concepts that must be learnt in order to be abstract enough to deal with a variety of phenomena Here are some examples of concepts in geography·

distance site region node form situation location
access centrality processes spatial morphology distribution
pattern catchement dispersal interdependence resource diffusion

Such concepts help in the organization and classification of information which could be by enumeration, for example mountain systems, settlements size, nodal location, groupings, for example structure, rock hardness, agent of erosion responsible for the features and labelling or categorising for example by determining the heirarchy of the phenomena large and small scale industries.

The concepts help classify phenomena whereas principles explain, predict and identify controls of phenomena. There are principles dervied from scientific discovery; others are from judgement and agreement among experts In physical geography several of the principles are of the first kind and in human, and regional geography of the second type.

For example:

(a) Body moving in any direction on the earth's surface will tend to be deflected, owing to the earth's rotation
(b) The climate of a place depends on latitude of the location, relief, on the sea and maritime currents
(c) The increasing role of development is to break down the friction of distance.
(d) If there is no diversity in the natural environment than all differences among man's activities would not develop beyond the limits existant.

The specific characteristis of principles are that these statements contain a set of conditions' a set of consequences and

relationship between the consequences and conditions which enable explanation, reasoning, generalization, prediction of problem solution to be made.

In the following statements (b) and (c) are principles whereas (a) and (d) are statements of relationships of generalization

(a) Recycling and substitution of minerals resources are the important planning options available for mineral conservation. (Generalization)
(b) Lowering of reqirements for minerals result from recycling and substitution (Principle)
(c) Volume, availability and value determine the selection of the location of the mining areas near markets or as a regions economic activity (Principle)
(d) matallic mineral raw materials have a wide variety of uses and their environmental impact is diverse (Generalization)

The selection, statement and use of principles in content analysis relates the concepts to each other and enables the evaluation of significant information only, to be ensured.

The identification of concepts and principles is followed by defining the specific objectives which are to be performed These in geography are usually those requiring learners to identify and analyse certain specific problems or situation and give decisions. Use of both concepts and principles are involved in problem solving and these can be planned for in a learning unit.

The following example of a problem solving analysis of content illustrates this

Habitat and Resources

Problem

1. How can habitats be recognized according to their modifications by man?
   1 1 Given the resource base and activities of cool temperate Western margin regions of Western Europe, New Zealand, and British Columbia identifies differences in the use of resources.

1.2 Explains why lumbering as compared to dairying is more developed in British Columbia, and dairying developed both in New Zealand and in Western Europe

1.3 Draws conclusions regarding the conditions and responses of human activities can be drawn

Problem

2. What factors are important in deciding the advantage of a particular use of available resources?

2 1 Explains what would happen if the original land cover of New Zealand and Western Europe were revived

2 2 Lists under what conditions the dairy industry could not grow in the British Isles and succeeded in Western Eurpoe.

2.3 Applies the causes of the growth of the dairy industry in New Zealand and verifies its applicability in Western Europe

2 4 Proposes a plan for developing a diversification of the dairy industry in New Zealand.

Formative and Terminal Evaluation

When writing the question the identification of the test situation must be such that it is (i) relevant, (ii) adequate, (iii) related to the information already known, (iv) related to the teaching strategy (v) possible to transfer learning in the subsequent unit.

Objective	*Class-room or developmented Formative Evaluations for [Review, Drill Summary, Feedback]*	*End of course Evaluation Questions for [Comparison of students] Placement of students*
1. The Pupil recalls the types of irrigation of plains, plateaus and hill areas.	1 1 Why should wells be more expensive than canals for irrigation even in plains?	1 1 Compare the types of irrigation facility found in plateau, plain and mountain areas in India and suggest why these are most suitable?
	1 2 Where is underground water the only source of irrigation?	
	1.3 What are the advantages of Multipurpose projects?	
2. Identifies the reasons for the variety or irrigation methods used	2 1 Which irrigation method would be most suitable for the Himachal area, Terai region and western U P ?	2 1 Give four reasons why canal and well irrigation are both used in the Ganga plain
	2 2 Why are both canals and wells used in plain areas?	
	2 3 Which method of canals are best used for flood control?	
	2 4 What measures can make tube wells as useful as canals for large scale irrigation?	

The above examples are specifically given to illustuate how concepts, principles and problem solving can be related in the teaching of geography and have to be developed in such a manner to improve testing The two units on Transport and Communication in India for class IV and Natural vegetation and wild life in India for class X illustuate the planning of learning units

The next step is related to planning the evaluation strategy for each of the stages during the course and at the end of the course. When framing questions for evaluating, each of the content inputs must be taken up and broken down into a series of question by which review, classification, partial relationships and causes or effects in a specific situation can be assessed

For instance in the analysis of Devouring the Potential (appendix A) the following would illustrate the difference in the type of questions which form a part (formative) during course evaluation and (summative) end of course evaluation.

3 locates the major irrigation schemes and types of irrigation in the country	3 1 which type of irrigation is is found in the areas marked on the map?	3 1 On the given map of India located the areas which have 1 Well Irrigation 2 Tank Irrigation
	3 2 In the following rock strata section where would the wells be located?	3 2 Name the MPP's which
	3 3 In the given sketch which is the best location for a multipurpose project?	3 3 Locate and label at least two MPP in Maharashtra State on the given map

This effort when systematically undertaken for each of the listed objectives not only generates a large number of questions but provides a method of assessing not only each particular content input but an ability also.

Using objectives for evaluation simplifies the task of testing immensely. The advantages of spending some effort by a group of teachers to analyse the objectives and content of a topic helps in the long run to improve test construction, plan worth while teaching and remedial activity, pace learning and plan the use of the term time True, today, without this effort too several teachers make a success of teaching and testing but the validity of their approach is never verifiable as will be when the objectives are defined

- When analysing content, as in the following example the relationship between the major idea and the basic understandings must be such that it is remembered even if all the facts are forgotten and basic to the study of other geographical interpretations as well.

Major Idea

Climate and natural environment have varying influence on the life of man, but the basic needs of man's are the same every where.

Basic Understandings

1. Different regions grow different products and provide bases for industries and occupations

2 Habits, settlements, food got from the natural wealth, to meet the basic needs of man and those get different characteristics in different regions

3 Life in one country is different from that in another only in detail, it is at the same time similar and an integrated unified whole

Content

Life of some natural regions of the world

(a) Equatorial· Nigeria
(b) Prairies and grass land of Argentina
(c) Deserts Arabia, Sahara
(d) Polar Siberia/ Canada.
(e) Monsoon China, Burma

Source Social Studies,
A Draft Syllabus for classes
I-XI D C M T (1965)
N C E R T

APPENDIX A

Devouring the Potential

Lack of development was probably the main reason behind our poverty in the past. But the present status quo, despite the reasonable pace of development is due to our continuously increasing numbers. The increasing numbers is hard reality that is going to stay with us for a while; it cannot be washed away

One thing that people need most is 'food' It is therefore necessary that our food production must increase in step with our growing numbers For producing more food, we need land, water, labour, skills, science, engineering, administration and management During the last three decades, we have advanced on all these fronts, but have marely been able to maintain per capita consumption constant. We have brought under cultivation 60 million hectares extra The total area under cultivation now is about 180 million hectares i e more than half of our geographical area. The rest is forests, hills, pastures of barren land *The scope for bringing more area under cultivation, without upsetting the ecological balance is now very limited,* (Generalization) except perhaps in parts of Rajasthan We have therefore to depend mainly on increasing the yield from our existing farms The most important input for increasing yield is water i e irrigation Admittedly, irrigation alone is not a complete guarantee for food sufficiency, but it is the most essential requisite The advantage of higher yields from other inputs like fertilisers and improved seeds can be realised only with assured irrigation. Fortunately, there still exists a sizable potential for making more water available for irrigation.

Past Performance

Irrigation has been practised in our country since ancient times It was necessary, given the kind of weather we have The methods of irrigation developed in ancient times are widely used even now. The *well water* is drawn using manually operated or animal operated mechanisms of various kinds The irrigation is practised wherever it is possible to impound water in a natural depression or a stream course *Flood irrigation*, a somewhat risky operation, is also practised in some areas, by blocking the path of a seasonal stream by a mud bund so that the water spills over the banks. Diverting the water of big streams into *inundation and perennial canals has also been in practice. But the construction of major multipurpose reservoirs* by damming large rivers is a rather recent development.

During the last three decades, our performance in developing irrigation has been commendable in all respects except one i.e. it has always fallen a tiny bit short of the requirements of our growing numbers, necessitating an import of food grains to the tune of a few million tons annually, on the average. The strides in food production have nevertheless been remarkable Food production has gone up from less than 50 million tons to more than 100 million tons. This is partly the fruit of a large number of irrigation projects,[1] major, medium and minor, that were undertaken and completed by our engineers *The area under irrigation has thus been doubled from 20 million hectares to about 45 million hectares. The development has not however been uniform in all regions* of the country (Principles). There are several reasons for this The major reason of course is techno-economic i.e. *cost/benefit ratio* of the irrigation works This, in turn, depends upon a number of physiographic factors, which happen to be very favourable in the Indo-Gangetic plains Here, the Himalayan rivers carry substantial amount of water perennially (though the discharge is maximum during the rainy season) We put an obstruction (barrage or weir) in the path of the river and divert the water in a canal

1 The classification of major, medium and minor schemes is arbitrarily done on the *basis of cost*, it could also be done on the basis of *irrigation potential of the scheme As far as irrigation is concerned, what finally matters is the total utilisation of water* . (Generalization)

Plains makes it possible for the canals and their distributaries to run under gravity and spread the water over large areas of thick fertile allivium Cutting the canals, and the distributary system, in the plain is a realtively easy matter. Many of our canals and distributaries run for hundreds of Kilometers and provide a *pernnial irrigation supply* Sirhind Canal (Sutlej) Upper Bari Doab Canal (Ravi), Western and Eastern Yamuna Canals, Agra Canal (Yamuna), Upper and Lower Ganga Canals, Sarda Canal (Sarda and Ghaghar) are some of our major diversion canals *The capacity of these canals, large though it is does take full advantage of the enormous quantity of water that is available in our rivers during the rainy season* and for several months after that. (Generalizasion) Their capacity was designed on the basis of an ad hoc criterion that they should always run full, even during most of the lean period when discharge in the rivers is small This makes good sense from the point of view earning *maximum revenue per unit cost* But this also implies that the designed capacity of the canals is too small to take full advantage of the flood discharge during the rainy season This handicap is particularly noticeable for the canals taken from the Ganga and its tributaries on which no demand storage has yet been built Ignoring this aspect, *the fact remains that the diversion canals provide the cheapest water for irrigation* (Generalization) Hence, our deference for them In certain situations, it has been found expedient to pump out the water directly from the river into small canals which irrigate the nearby fields. Such *lift irrigation schemes offer the advantage of quick installation but are considerably more expensive*

The situation is very different for non-Himalayan rivers. They are not snow-fed, therefore they stand to dry up during summer In order to feed perennial canals from these rivers, we need to impound the flood waters of the rainy season in tanks and reservoirs. Irrigation by small canals fed from tanks has been popular in Andhra Pradesh, Karnataka and Tamil Nadu, and to a lesser extent in several other states also However, major perrinnial canals can be fed only from major dammed reservoirs like Tungabhadra or Nagarjunasagar (which is yet to be completed) On the other hand, *irrigation by well water can be undertaken anywhere if the ground water is conveniently available* (Principle) That is why there has been a phenomenal increase in the exploitation of ground water during the last decade The most intensive development has taken place in western Uttar Pradesh, Punjab, Haryana, Tamil Nadu and Gujarat, and to a lesser extent in eastern Uttar Pradesh, Bihar, Maharashtra, Madhya Pradesh, Rajasthan and West Bengal

In the post-independence era, several major multipurpose river valley projects were undertaken and completed Bhakra-Nangal, Damodar valley, Hirakud, Rihand, Kosi, Tungabhadra and Chambal are some of the projects we often hear about. They are outstanding engineering feats These projects serve three main purpose i e , irrigation, power generation ann flood control.

Several other beneficial aspects like fish culture, water transport, recreation, soil conservation, afforestation etc are also included as objectives of these projects

The main problem in undertaking the major projects is the requirement of *heavy resource commitment* (also involving a sizable foreign exchange component) over a long period The major projects usually take ten years or more to complete. After they are completed, they bring prosperity (relatively speaking) to the region If for any reason, some of our major works go out of commission, millions will have to starve

Of late, there has been some concern about the rapid siltation of some of our major reservoirs Efforts are afoot to identify the causes Meanwhile some conventional remedial measure (such a afforestation and soil stabilisation) have also been initiated.

One would think that *the irrigation proejcts are so planned that evey drop of water made available for irrigation would indeed be utilised* But, our experience in the past has shown that certain bottlenecks make this realisation difficult The reasons are both technical and economic *The technical snag arises from the fact that all aspects of the scheme do not get completed simultaneously.* (Principle). The canal and distributaries may all be ready, but the field-channels, which take the water to the farmers' fields, may not be ready or the fields may not have yet been properly levelled by the farmer to permit irrigation by gravity flow. It takes a while before these problems get straightened out.

The *underutilisation due to economic factors arises mainly from the farmer's inability to pay for the water* (Facts) The authorities try to get over this problem by spreading the distribution network (command area) over a large number of fields. This enables them to sell more water, but this policy has its own disadvantages. Firstly, it leads to increased loss of water due to seepage and evaporation over an unnecessarily large network. Secondly, it renders the supply somewhat uncertain and unreliable since it is promised to more customers than it can be delivered to The situation has however changed recently. The demand for irrigation water has increased immensely and the utilisation has become quite high It is now due more to technical factors that utilisation may sometimes suffer rather than due to want of customers who are willing to pay

The operation of groundwater supplies, wells and Tubewells, is at present, by and large, in the hands of private individuals They try to get over all the technical hitches (in fact, by an unnecessarily large-margin). But the utilisation of their installed capacity is very poor since the private well or tubewell is used mainly for meeting the relatively small demand for private irrigation Most of the time, the well is idle. *Thus the certainty and reliability of the private ground-water supply is acquired at great national cost.* This luxury will continue to proligerate until the State tubewell programme becomes widespread, and becomes more efficient. Alternatively, the existing private wells (with and without pump sets) *and tubewells must start catering to the demands of the neighbouring community and thus run much longer than they do now* (Theory) Or, perhaps completely new thinking in groundwater technology is called for.

An extremely cheap low draft groundwater supply suitable for meeting the requirements of small farms (One hectare) needs to be invented Ideally, it may be powered by wind or solar energy But *wind and solar energy have the disadvantage of being diffuse and intermittent,* and therefore the contraptions using wind and solar energy are, in general, unwieldy, inconvenient and expensive (Theory). These contraptions have *not proved very practical so far.* Muscle power appears to be our best be (Availing the Potential).

We seem to have succeeded very well in developing irrigation by minor schemes like wells, tubewells (shallow and deep), tanks and lift schemes This is going to continue, on private, community and government levels In certain regions, groundwater development is proceeding very rapidly Mainly because of its appropriateness under the existing conditions the governmental policy also has a lot to do with this. Indigenous and readily available technology has made the installation of wells and tubewells an easy and quick matter Further, the paper-sets both electric and dienal, are also readily available The extension of electric power in rural areas and availability of diesel and easy credit are making pump-wells and tube-wells a feasible proposition for an average farmer. *This trend is likely to continue and catch on. We can therefore expect that during the next twenty years, or perhaps even earlier, 30-40 million hectares will come under groundwater irrigation* (Theory)

At present, the backbone of groundwater irrigation is the dug wells notwithstanding a spurt in tubewell construction The situation may not be radically different in time to some except that the future wells may by operated somewhat deeper and a larger number may be operated by pump sets rather than animal power In either case, we shall be able to push the groundwater exploitation to its ultimate optimum limit (Principle)

There are no ready estimates available as to how much extension we can ultimately achieve on irrigation by large and small tanks The basis of the existing ones are reported to be silting and their storage capacity is thus running down Desilting operations, despite some practical difficulties, must be carried out

We have recently constructed a large number of tanks in drought effected areas Some of them are termed 'procolation tanks' implying that they help in increasing the recharge of water underground and thus making more water available in the well in the downstream area Their normal storage capacity is however generally too small to justify the effort, except as a relief measure.

Another practice in Konkan is to put small bunds cross the streams towards the end of the rainy season *This is indeed helpful in restraining the loss of groundwater by effluent drainage.* (Principle). The water collected in the stream is picked up for irrigation, manually or by using pump sets Such mini-schemes are likely to become more popular But it is difficult to estimate their total impact quantitatively. They are undoubtedly beneficial and cost effective (Principle)

Scores of major and hundreds of medium irrigation works are likely to be completed in the next two decades We have not yet exhausted the potential for building even simple diversion canals, from the Himalayas rivers The Sarda Shayak project now underway would utilise the waters of Ghaghra, its irrigation potential is almost double that of the upper Ganga Canal In addition, the diversion of flood water for irrigation of Kharif crops can be taken up This is comparatively less attractive, but has an immense potential While the development of works on Himalayan streams will continue, a great spurt in development schemes will be witnessed in the valleys of Narmada, Godavari, Krishna and other interstate streams in the peninsula. The projects held so far due to interstate disputes on sharing waters are bound to be cleared, with appropriate modifications wherever necessary A large number of multipurpose projects, involving the construction of dams, a network of canals, power houses and lift schemes will be taken up. The concerned State Governments have already drawn the schemes *The demand on national resources will be tremendous and will have to be met by some sacrifice elsewhere.* When we enter the 21st century, we would have about 100 million hectares under irrigation and our annual utilisation of water will be stepped up to 80-90 m m. This formidable task will be achieved by the engineers, administrators, managers and the nation as a whole.

We cannot afford to fail in this. In addition to partriotic fervour, the 'will to survive', will continuously propel us to work towards the goal *Extension of irrigation and the intensification of agriculture is the only way for providing gainful and stable employment For Our Growing Millions.* (Generalisation). It will be decades before voluntary (and even compulsory) family planning stabilises the population and its pressures Meanwhile, we cannot afford to let the lack of food take over the control of our numbers. There is only one direction in which we can now go, that is forward. *We cannot afford to overplay the 'ecological scare' either Irrigation facilities must grow, and grow fast. However the growth must be judicious.*

Source : Our Water Resources
Rama, NBT, 1978

CONTENT ANALYSIS

[*Devouring the Potential*]

Terms	*Specific facts*	*Concepts*	*Generalizations*	*Principles*
1	2	3	4	5
	1 1 180 million hectares only 80 m hectares have been brought under cultivation	Potential under utilization poverty/starvation prosperity	Increase in numbers retards the pace of development	1 Welfare objectives vs cost benefit as priority for deciding choice of irrigation types
	1 2 Area under irrigation has doubled from 20 m—45 m hectares in	man land ratio ecological balance cost benefit ratio revenue per unit cost	Population increase in a long term solution whereas food is a immediate concern	2 Extension of irrigation and agriculture is the only intersification of way for preciding gainful + stable employment.
Well water flood irrigation inundation canals multi-purpose reservoirs		soil conservation resource commitment	Planning to develop the potential water for extend it to half the cultivated area is the priority for the decade	3 Techno-economic factors controlled by physiographic make the use of water resorces beneficial in terms of the expenditure incurred
	2 1 Perinneal canals not suitable for flood control		development not uniform all over the country	4 In irrigation the total utilisation of water is the main criteria to measures utility
	2 2 Wells privately owned social benefit not possible	gravity flow	plains perinneal water supply, level land	5 It will be possible to push the water resources utilisation only to the limit of available cultivable land.
	2 3 Cheapnes of diversion canals		surplus water not used	
	80 lift irrigation through easier because of expense	Ground water	Under utilisation of water resources is the result	It is due to technical factors that utiliza

1	2	3	4	5
	not developed		of deriving minimum return for least investment	suffers not non-availability for consumers who can pay
	Phenomenal increase in Western U P Punjab Haryana T N and to a lesser extent in U P, M P, Bihar Maharashtra, Rajasthan and W B		Phenomenal increase in the utilization of ground water because of convience of utilizing it tube wells must cater to the community not individuals	certainity and reliability of ground water is got at great national cost
	Last decade 7 M P Project executed Takes 7 years for a M P P to be commissioned and maintainenance in a continuous expenditure		Multipurpose projects are more beneficial for they take comprehensive area development into consideration M P P require heavy resource commitment	Long term benefits usually ignore short term inequalities and disadvantages Which cannot be but must be resolved. (Please see where the analysis is derived from in the text)

APPENDIX

Some common verbs used for stating General Instructional Objectives

Analyse
Apply
Appreciate
Comprehend
Compute
Create
Demonstrate
Evaluate
Interpret
Know
Locate
Perform
Recognise
Translate
Use
Write

Complex Logical Judgemental Behaviours

Combine
Compare
Conclude
Contrast
Decide
Deduce
Defend
Evaluate
Explain
Formulate
Generate
Infer
Plan
Structure
Substitute
Suggest
Support

Practical and Fieldwork related Behaviours

Conduct
Convert
Demonstrate
Lengthen
Manipulate
Limit
Operate
Prepare
Replace
Report
Reset
Set
Specify
Calculate
Check
Compute
Count
Derive
Estimate
Graph
Extrapolate
Interpolate
Measure
Number
Plot
Reduce
Solve

CONTENT ANALYSIS

Class IV

Transport and Communication in India

I. Major Understandings

1. Transportation is a means to help the movement of people materials from place to place
2. Transport vehicles use different routes to travel depending on the terrain
3. Means of transport have developed and changed over the ages becoming quicker and safer to travel by
4. Transport routes make access to different places easier and helps them develop
5. Telegraph, postal, telephone, radio and television are means of communicating between people who live in different parts of India.
6. Communication helps in keeping people in touch with each other and getting to know about each other better

II Objectives

Pupils are able to

1. Observe
    - (a) different means of transport in the locality
    - (b) routes used by different means of transportation
    - (c) speed of different means of transport
    - (d) types of communication facilities
    - (e) goods carried differ in different means of transport
2. *Classsify means of transport using different basis like*
    - (a) old and new
    - (b) manual and mechanised
    - (c) fast and slow
    - (d) materials
3. *Measure*
    - (a) the distances covered by different means of transport from a map
    - (b) estimate time taken to cover a distance from home to school by foot, by cycle and by bus or car
4. *Using space-time relationship*
    - (a) to compare changes in the types of transport in older and modern times
    - (b) to compare speed and distance of moving vehicles
    - (c) To perceive the use of sound and pictures through wires and sound waves

5. *Communicates*
    - (a) through pictures and diagrams the different means of transport
    - (b) collecting communication material like postage stamps, letter paper etc
    - (c) through written and verbal expression
    - (d) safety rules, as pedestrians, cyclist, and commuter, through role play

6 *Investigate*
    - (a) activities at a depot, railway station, airport, shipyard, post office
    - (b) how many types of vehicles pass by the school and who travels in them
    - (c) the changes in transport means over the ages

7 *Generalises*
    - (a) that transport has brought different parts of the country closer
    - (b) means of transport in mountainous areas and the plains.
    - (c) communication means help the rushing of aid to areas which are affected by disaster.
    - (d) effect of imporved means of transpoit for the development of industry and agriculture

8 Appreciates the role of transport and communication for the development of the economy of a region

Teaching Learning Activities

5. Communicates

1. Discovery of the development of transport means from ancient to modern days through visit to museum, explanation by teacher and model or pictures making or (1,2,3,4,5 objectives)
2. Pupils oberve the different means of transport on their way to school, count the number of vehicles on the road, the time to travel by fact, cycle and bus to school from home
3. Investigate by interview the activities of any transport controlling centre (railway station, bus depot, airport, local blacksmith, carpenter, repair shop) (6,7)
4. Dramatise and role play the activities of a policeman, post master, bus conductor, pedestrian, bicyclist (objective 8)
5. Study the maps of rail and road routes of India to find the pattern, cities connected, and the density of transpot routes in different regions of the country (1,3,6,7).

III. Evaluation

1. *Map study*

(i) Copy the road map of India Mark in different colours the National Highways, State Highways and show by symbols capital cities and industrial townships

(ii) Mark the ports of halt on a steamer journey from Calcutta to Surat

(iii) Use the scale of the map to measure the distance by road and rail between Delhi and

Madras and Banglore Find out which route is longer Find out the railwsay fare for Madras these journeys and duration of time from a railway time-table or enquiry

(iv) Compare the physical feature map of India with the rail and road map and find out
  (1) In which region the rail and routes are the least.
  (2) Roadways are more than railways
  (3) Towns linked by both rail and road.

2. *Activity Based Questions/Project Work*

The investigation about the activities of a transport centre would be undertaken by pupils using the group guide sheets Teacher could evaluate the pupils by asking oral questions and using a checklist to observe the procedure adopted

a) Group guide sheets for students

1 Activities of a blackmith, carpenter and bicycle repair shop

(1) Prepare a questionnaire to use when your interview the blacksmith, carpenter and bicycle repair mechanic Your questions should cover

A the part of the vehiles that are made,
B the procedure used to make them,
C the materials that are needed,
D the places from which the material is bought,
E the people who buy them,
F. the cost of making or repairing,
G. the number of parts made in a month

2 2 Draw a sketch of the vehicle that is made and mark the materials used for different parts

3 Set out your findings in wall charts to show all you have learnt from your study Display your collections.

2 *Bus depot*

1. Take a census of the buses standing in the depot according to whether they are for standby or being serviced or repaired.
2 Make a plan of the layout of the bus depot and the use of its different parts
3 Copy the map showing the bus routes that are connected to the depot
4 Interview a bus driver if you can Enquire about how he knows where to go, what timings does he follow, how many days he works, what rules does he have to follow
5. Prepare a brief report about
  (a) the purpose of a depot
  (b) the activities in a depot
  (c) the routes and the places they don't reach or connect.

Illustrative Questions

List the different vehicles noticed on the way to school

2. What changes over the ages have occured in the transport and communication services in

   a) type of wheels
   b) material of vehicles
   c) energy used
   d) speed
   e) passengers
   f) routes used
   g) fares

3 Some statements are given below Write against each statement if it is the effect of

   A development of roads
   B availability of railways
   C. availability of airways
   D.function of telegraphs

1 bringing of vegetables and grains to the city (   )
2. carrying coal, oil, ore to iron and steel plants (   )
3 collecting news about different parts of the country (   )
4 making hilly areas more accessible to tourists (   )
5 delivering letters and newspapers on the same day from one city to another (   )
6 taking fresh fruits and vegetables
without letting them go rotten (   )

4 Which of the following was the main force of transport in ancient days?

   A. wind and water power
   B electrical power
   C. steam force
   D atomic energy (   )

5. There are a dense network of roads and railways on the

   A plains
   B hilly
   C desert
   D. coast (   )

6 When travelling by railway which of the given journeys will be the longest

   A. Jaipur to Ahmedabad
   B Hyderabad to Trivandrum
   C Madras to Bangalore
   D. Calcutta to Ahmedabad (   )

7 On the basis of relationship between first and second word write the fourth word on the space provided
 1 iron ore, goods train . perishable goods ————————————
 2 animal carts engine ——— ——— ———————————
 3 railway train rails · lorry ——— ——— ————————

8. Why do fast moving transport need under them stronger roads than bullock carts?

9 Why is air travel more expensive than rail or bus travel?

10 What advantage does television and radio have for bringing people in our country closer?

Assignment

1. Prepare a plan showing the places to visit and type of travel preparations needed for a visit to Kashmir. Give details of the days of travel, mode of travel and places of halt of the visit

2. Find out how a telegram is sent and describe the process

3 Find out about the important canals and rivers that are managable in India and what they are used for

4 Find out what changes have been brought about in the railways since Independence with regard to (a) routes laid, (b) speed, (c) electrification, (d) size of trains

CONTENT ANALYSIS

UNIT : Natural Vegetation and Wild Life in India

Class : VIII

Periods: 6

A. Overview

Natural vegetation and the wild animals associated with it, constitute an important element of our environment and are resources of great national significance with a lot of potential Hence this unit forms a vital part of the study of geography of our country Of late, the biotic environment has suffered from considerable neglect and human rapicity in our country so much so that its ecological balance appears to have been seriously upset. The forest cover is fast dwindling leading to less in terms of timber resources and subjecting of land to gully erosion Our planners are seized with the enormity of the problem so much so that afforestation is now receiving high priority Social publicity is launched through such programmes as 'Van Mahotsava' and 'Social forestery' It is, therefore, necessary that our young learners should be made aware of the basic issues underlying it and related information leading to development of positive attitudes towards our part in the biosphere

This unit will be taken up for study after physical environment—landforms, relief and climate—has been taught It will consist of following lessons and sub-units

Lesson 1 · (i) Concept of biotic environment - natural vegetation and wild life
(ii) Factors determining its nature and extent
Lesson 2 Major types of natural vegetation found in India and its distribution
Lesson 3 · Our forest wealth and its exploitation (utilisation)
Lesson 4 Wild life in our country and its preservation
Lesson 5 Conservation of natural vegetation and afforestation (man-made forests)
Lesson 6 Review and Evaluation of the Unit

It may be particularly emphasized that while handling this unit care should be taken to refer to facts of history, especially recent history which throws light on formation of bad-land topography through overgrazing and reckless felling of trees and need for planned development and restoration of ecological balance (biology)

B. Content Analysis (lesson-wise)

1.00 *Concept of Natural Vegetation and Factor Determining Its Nature and Distribution*

1 10 Natural vegetation represents that cover of plant life which grows on mass scale over a region in accordance with factors of natural environment
1 11 Natural Vegetation as orginal or virgin cover of plant life
1 12 Unaided by man in its growth. Adaptation to environment gives support to unique plant characteristics
1.13 A unique or particular type of plant cover combination trees, grass, shrub, etc, occur in a climatic region

1.14 Spread over a reasonably large tract of land to be called a type

1 15 Natural vegetation as a factor in shaping the land-scape of a region

1 20 Natural vegetation varies from region to region depending upon the nature of terrain and climate

1.21 Plant life needs soil and rocks which hold it, allows roots to penetrate and supply moisture and nourishment

1 22 Very hard rocks and sandy soils do not permit large size trees to grow

1 23 Temperature and moisture are essential factors in determining the type of vegetation.

1.24 Moisture can be provided either through rain or underground sources

large—trees in rainy parts and along the rivers in arid lands

1 30 Climate mirrors through the cover of natural vegetation and lending variety to it through seasonal changes

1 31 The period of growth of the plant and its characteristics of leaf, bark, size is determined by the shape and level of temperature

a At freezing point plant growth ordinarily stops Higher the altitude smaller and lower the plant size

b In cold climate the plant life has a shorter period for growth

c Different plants require different temperature conditions

Hence there is seasonal growth of plants and occurrence of phenomena like fall/shedding of leaves, hibernation etc

d —Tropical
— sub-tropical are the resultant
— Temperate and vegetation types
— cold climate plant life. related to temperature

e. Some important names of trees
—Mahogany, Rubber tree, Teak, Sal, Banyan, Bamboo
—Walnut, Mulberry, Olive
—Oak, aspen, chir
—Deodar, fir, pine

f Where winters are very cold and snowfall, trees shed leaves Such trees are called temperate deciduous—leaves falling in autumn

Where there is cold throughout the year the trees have adapted to these conditions modifying their leaves to the shape of needles which are not affected by cold. They are called coniferous ever green trees e g pine, fir, spruce, etc In polar areas small shrubs and stunted willows, lichen and mosses grow.

1 32 Rainfall is the main important source of supply of moisture to plants.

a Amount of rainfalls in a year determines types of vegetation

b Seasonal character of rainfall also affects the character of vegetation

c Wet climate throughout the year in a tropical region leads to evergreen dense forest vegetation

d Heavy rainfall over a large part of the year also leads to evergreen or semi-evergreen dense forest vegetation

e Moderate rainfall over a limited part of the year leads to their forests where trees shed leaves to face dry weather—such trees are called monsoon deciduous trees e g Neem, Teak, Sal, Mango, Mahua etc

f Moderate rainfall over a small part of the year does not help many trees to grow, but allows grass to grow seasonally This is called grassland vegetation

—Tropical grass land—Savannah

—Temperate grass lands—Prairе, steppes, pampas

g. Higher is the temperature, more rainfall is neeeded for plant growth and greater is the variety of plants both in size and characteristics

—Evergreen forests in tropical region need more rainfall than evergreen forests of cold region

h In some regions plants have adapted their leaves, bark and roots to sustain themselves in dry weather so much so that these trees remain evergreen i e do not shed leaves in a particular season i.e , lemon and orange trees. These forests are not dense. (Mediterranean type of vegetation)

1.33 Some important types of vegetation in Tropical and subtropical region

a Tropical Evergreen/Semi Evergreen

b Tropical/sub-tropical Decidous

c Tropcial/sub-tropical scrub vegetation

d Tropical/sub-tropical Grass land

e. Semi desert/Desert vegetation

f Sub-tropical Evergreen i e , Mediterranean vegetation.

1 34 Some important types of temperate and cold climate vegetation

a Temperate Deciduous

b Temperate grass land

c Coniferous Evergreen

d. Tundra type · Cold semi-deserts

e. Cold desert

1 40 There is a relationship between the type of vegetation cover and composition of wild life-rich wild life in tropical forests; large animals in tropical grasslands; fur bearing animals in cold climate etc.

1 50 Man has interfered with natural vegetation to the extent of upsetting the ecological balance

a Over-exploitation of forest resources leads to counter productive results

— soil erosion

— loss of forest cover

2 00 *Major types of Natural Vegetation in India*

2 10 Except the high mountains and hills, the types of natural vegetation in our country are determined by the amount of rainfall.

2 11 Very heavy rainfall (over 200 cm),

Tropical Evergreen and Semi Evergreen forest

—East part (Nagaland, Assam, Manipur, Meghalaya, Arunachal etc)

—West coast (South Part)

—Important trees · rose wood, mahogany, cane etc

2 12 Heavy rainfall (100 cm to 200 cm)

Tropical Deciduous forests · (i) Eastern India Tarai region, West coast/Maharashtra, Bihar etc

Important trees—Teak, Sal, Shisham, Sandal wood, Arjan etc.

2 13 Moderate rainfall (50 cm to 100 cm) Thin Tropical forests
—East Rajasthan, Central Deccan plateau, Gujarat etc.
Babul, Neem, Tamarind, etc
2 14 Low rainfall (25 cm to 50 cm)
Scrub land Semi desert
2.15 Less than 25 cm Desert
2 20 The type of natural vegetation cover changes according to fall in temperature as one goes up the mountains
2 21 Tropical vegetation upto 500 metres (in the Himalayas)
2 22 Sub tropical vegetation 500 to 1500 metres
2 23 Temperate vegetation 1500 to 2500 metres
2 24 Cold temperate vegetation 2500 to 3500 metres
2 25 Cold desert above 3500 metres
2 26 In Southern India (Nilgiri Hills) the change in vegetation type occurs at relatively high altitudes because of its tropical situation
2 30 Near the sea coast and in the Delta region the trees have adapted themselves to salt water and effect of tides
2 31 Mangrove forests caurina in new delta and e g Sunderbans
2 32 Coconut trees e g along the lagoons of Malabar coast
2 40 The spread of agriculture over vast areas in the country and no systematic effort to conserve has led to disappearance of natural vegetation cover over more than 60% of its land This situation is also said to be aggravated due to population pressure by some authorities
2 41 Absence of natural vegetation cover over the fertile northern plains and coastal lands. Heavy deforestation in catchment areas of rivers in the Himalayan region
3 00 *Our forest Wealth*
3 10 Our forests are a valuable resource for supply of a variety of timber
3 11 Very hard wood Rose wood, Ebony, Mahogany etc
—Tropical Evergreen forests
3 12 Hard and semi-hard wood timber e g Teak, Sal, Hindu, Shisham, Sandal wood, (Hard) Semul, (semi-hard) Tropical Deciduous forests
3 13 Soft wood e g Pine, deodar, fir, Himalayan Mt forests.
3 14 Fire wood from all types of forests and scrub lands
3 20 Bamboo and cane are attained in our forest in vast quantity
3 30 Grasses found in our forest are used for paper making, packing fodder for cattle and raffia work
3 40 Some useful chemicals are obtained from the trees found in our forest

- a Sandal wood oil from Karnataka forests and also around Paras Nath Hills, Bihar.
- b Katha from Tarai forests and some forest of M.P
- c Tanning chemicals from bark and fruits of some trees e g bark of sundari, babul etc and fruit of myrobolan etc
- d. Resin from pines calyplus

3 50 Medicinal herbs are obtained from our forests

3 60 Leaves of certain trees are used for industrial purpose e g Tandu leaves (Biri) and leaves for preparing pattals and packings

3 70- A variety of materials are obtained from insects and animals living in forest e g

- Lac
- Tussar
- ânimal's fur and pelts

3 80 Forest as pasture land/Forests control erosion, reduction of pollution and increase of moisture in the air

4.00 *Wild Life in our Forests ann Its Preservation*

4 10 There is interdependent relationship of natural vegetation and wild life

4 11 Herbivorous animals feed on vegetation and control and help its growth in various ways

4 12 Carnivorous feed on herbivorous and thus control their number

- deer population is found to upset ecological balance in the absence of leopards and tigers in a forest (story of rabbit population eating away grasslands in Australia)

4 20 Destruction of natural vegetation cover leads to destruction

4 21 Need of special effort to preserve wild life

4 30 Too much movement of man in the forest distrubs wild life

4 40 There is a wide vareity of animal life in our forests

—	Carnivorous.	Lion, tiger, leopared, wolf, hyena
2	Fruit eaters	Bears, monkeys
3	Herbivorous	Elephant, Rhinoceros
4	Birds	A vast variety
5	Water animals	Crocodiles, Alligators
6	Reptiles	Snakes and Pythons

4 50 Wild life Sancturies and National Parks e g , Kaziranga (Assam), Corbett Park (U P.), Kanha (M P), Periyar (Kerala), Bandi (Karnataka), Sunder Bans (West Bengal), Hazaribagh (Bihar) Shashan Gir (Gajipur)

5 00 *Conservation of Forests and Afforestation*

5 10 There is urgent need for the conservation of natural vegetation to maintain balance in environment

5 11 Control over (a) reckless felling of trees, (b) overgrazing in forests, (c) forest fires, (d) clearing of forests for temporary cultivation (Jhuming) (e) shifting agriculture (f) urbanization/industrialization.

5 12 Need of selected and controlled cutting and growth of trees for commercial purpose

5 13 Need for a planned conservation through the activities of the forest department a simple idea of the work of forest department to be given.

5 20 Forest suffer from spread of various plant diseases—Need of scientific forestry—Forest Research Institute at Dehradun

5.30 Trees take time to grow and hence the need of replenshing them
a. leaving time for trees to grow
b. planning trees according to need
c. Afforestation (Man-made forests)
d. Procedures adopted in afforestation
e. Effort to provide natural vegetation cover in desert land to support animals and control desert of Rajasthan (Arid land Research Station at Jodhpur)

5.40 There is need of having more and more man-made forest to produce trees of commercial importance on large scale e.g. Teak, Sal, Sandal wood, Shisham, Eucalyptus, Bamboo Canes etc.
a. A simple idea of afforestation scheme in the locality
b. People participation in afforestation, 'Van Mahotsava'

5.50 Forest in the life of man Usefulness
- forest wealth
- check on erosion of land
- check of flood and silting of river beds
- affect on climate
- places of beauty
- check on air and water pollution

C. Instructional Objectives of the Unit

1.00 *Knowledge*

The pupil
1.1 recalls/recognizes (a) names and characteristics of various types of natural vegetation and (b) characteristic of various types of natural vegetation found in India
1.2 recalls/recognizes the states and regions where a particular type of natural vegetation is found in India.
1.3 recalls names of important timber and other commercial trees
1.4 recalls names and importance (a) various commercial products, (b) animals, (c) animal sanctuaries.
1.5 recalls methods of conservation of forests.
1.6 recalls procedures involved in afforestation.
1.7 recalls definition of such terms as natural vegetation, resource, afforestation, conservation, ecological balance, environmental pollution hard and soft wood, evergreen, deciduous etc

2.00 *Understanding*

The pupil
2.1 draws relationship between types of climate and types of vegetation
2.2 draws relationship between type of terrain and rock formation on one hand and extent of vegetation cover on the other.
2.3 explains the effects of over-exploitation of natural vegetation by the man

2 4 compares characteristics of one type of vegetation with other
2 5 gives illustration of forest wealth to prove the usefulness of a particular type of vegetation
2.6 explains why conservation and afforestation are in urgent needs
2 7 gives reasons for loss of much needed cover of natural vegatation in our country
2 8 explains the effects of poor forest policy and deforestation.
2 9 explains reasons for preservation of wild life
2.10 detects error in various statements describing characteristics of different types of vegetation
2 11 interprets various (a) diagrams, (b) pictures, (c) graphs depicting characteristics of vegetational types.

3 00 *Application*

The pupil
3 1 analyses data/information about climate/terrain to draw inferences about vegetational type.
3 2 draws inferences about success of various methods for improving our forest wealth
3 3 hypothesises about schemes of (a) setting up forest-wealth-based industries, (b) afforestation plans, etc
3 4 draws inferences about loss of land through erosion in past, present and future
3 5 draws plans/holds discussions/examines plans for development of forest resources of our country
3 6 interprets pictures and diagram to draw inferences about nature of natural vegetation and its utilization
3 7 evaluates through debates and discussions, problems of environment crises in biosphere

4 00 *Practice Skills*

The pupil
4.1 draws maps to show distribution of
(a) vegetation types
(b) forest wealth
(c) afforestation areas
(d) animal sancturies
(e) animal habitat and
(f) areas affected by deforestation

4.2 draws diagrams and sketches to show relationship between
a climate and vegetation
b vegetation and animal life and
c industries and natural vegetation
4.3 draws graph to show progress of various schemes of development of forests.
4 4 draws charts to show working of the Forest Department in the State
4.5 prepares models showing landscape of different region depicting
a pattern of natural vegtation
b. afforestation design
c. ill-effects of deforestation
4 6 collects specimens of different types of forest products and mounts them in the form of album.

Evaluation

UNIT TEST

Design

Title Natural Vegetation and Wild Life in India

Class VIII Time 40 minutes
Marks 25

Objectives*	K	U	A	S	Total
No. of Questions	7	4	2	3	16
Marks	8	9	4	4	25

Forms of Questions**	E	SA	VSA	0	Total
No of Questions	1	5	5	5	16
Marks	5	10	5	5	25
Approx Time	15	15	5	5	40 mts

Content Analysis	Marks
1. Concept of Natural Vegetation and Factor Determining its characterisitcs	5
2 Types of Natural Vegetation in India	8
3 Our forest wealth	5
4 Wild Life	3
5 Conservation and Natural Vegetation and Afforestation	4
Total	25

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*K — Knowledge, U - Understanding, A - Application,
S - Skill

** E-Essay, T-Type SA-Short Answer, VSA,-Very Short Answer, O-Objective Type

Subject . Geography Natural Vegetation and Wild Life in India · Class . VII
Maximum Marks : 25 Time · 40 mts

Blue Print

S.No	Objective	Knowledge			Understanding			Application		Skill Total
	Form of question Content Units	E SA	VSA	O	E	SA	VSA	O E SA	VSA	O E S
1	Concept of Natural Vegetation and factors Determining it		2(1)	1(1)		2(1)				5(3)
2	Types of Natural Vegetation in India			1(1)	5(1)				2(1)	8(3)
3	Our forest Wealth and its utilization					1(1)		2(1)	1(1)	5(4)
4	Wild Life and its Preservation					1(1)	1(1)		1(1)	3(3)
5	Conservation of natural vegetation and Afforestation					1(1)	1(1)	2(1)		4(3)
	Sub Total		2(1)	3(3)	5(1)	5(1)	2(2)	4(2)	4(3)	25(16)
	Total			8(7)		9(4)		4(2)	4(3)	25(16)

Notes - Figures within brackets indicate the number of questions and figures outside the brackets indicate marks

*Denotes that Marks have been combined to form one question

Summary	No of questions	
Essay (E)	1	Marks 5
Short Answer (SA)	5	Marks . 10
Very Short Answer (VSA)	5	Marks 5
Objective (O)	5	Marks · 5
	16	25

Scheme of Options

Scheme of Sections ·

Unit Test

Instructions

1 All questions are complusory
2 Answer the questions on the paper provided for the purpose
3 Put down the serial of the question and then write the answer
4 In case of objective type of question (Nos 1 to 5) give the answer by putting down the letter indicating the correct answer.
5 Questions on map should be answered on the map provided for the purpose and then attached with the answer sheet
6 Mark(s) which each question carries is (are) given in the margin against each.

Test

Q No 1 Which of the following trees provides soft timber? 1

A. Oak C Chir
B Semul D Banyan

2 Which type of natural vegetation does the sandal wood tree belong to? . 1

A Evergreen C. Scrup Vegetation
B Deciduous D Mangrove forest

3 Deciduous trees in the temperate region shed their leaves in the month of . 1

A January C. July
B March D October

4 The requirement food of which one of the following animals differs *most* from those of the others? 1

A Tiger C. Rhinoceros
B. Elephant D Lion

5 Which of the following trees is most likely to be chosen for afforestation in Chhota Nagpur region? 1

A. Babul C Sal
B. Casurina D. Palm

6 Give the designation of the highest officer who looks after the forests in your state. 1
7 Give the names of two animal sanctuaries in north India 1
8 Name two deciduous trees which are source of timber for furniture in India 1
9. On the given map of India indicate the areas where lac is collected (Map Question) 1
10 On the given map of India mark the area with crosses (X) 1
11. On the given map of India shade the areas where evergreen forests are found (Map Question) 2
12 Give essential features which characterize 'natural Vegetation ' 2
13. Give reasons why the coniferous trees take more time to grow than the trees in tropical rain forests 2

14 A person wants to set up a paper mill in North-West India Which State should he choose to apply for license and why? 2

15. How far is it correct to say that the cutting of forests is an invitation to desert? 2

16 State main characteristics of any two types of natural vegetation in India to show that the amount of rainfall received in the two regions is the cause of difference between *two* vegetations 2

Scoring Key and Marking Scheme

A *Scoring Key* [*Q Nos 1 to 5*]

1	2	3	4	5
B	B	D	D	C

B *Marking Scheme*

6 Chief Conservator of Forests		1 mark
7 Any two of the following. a. Corbett park (U P) b. Jagdapara (W B.) c Kaziranga (Assam) d Hazaribagh (Bihar)	½ mark each	1 mark
8 Any two of the following Teak, Sal, Shisham, Tun	½ mark each	1 mark
9 Chhotanagpur to Mirzapur district in U P	(On map)	1 mark
10. Laddakh, Himachal Pradesh and Northern Hills in UP Above the height of 3000 meters (upper western Himalayas)	,,	1 mark
11 (a) Malabar coast; (b) Eastern India (Parts of Manipur, Nagaland, Meghalaya, Arunachal and Upper Assam Valley forests)	1 mark each	2 marks
12. (i) Natural growth (without man's effort) (ii) Massive; compact i.e occupying a reasonable extensive tract	1 mark each	2 marks
13. (i) Shorter growth period owing to severe cold Insufficient temperature even during growth period i e. summer		2 marks as a whole

(ii) Contrastive conditions in tropical forests		
14 (i) Any one of the following North U P , Himachal Pradesh, Kashmir	1 mark each	2 marks
(ii) Supply of soft wood from the Himalayas		
15. Any two of the following		
(i) Severe Soil erosion		
(ii) Loss moisture in soil and depletion of underground water	1 mark each	2 marks
(iii) Loss of effect of trees to induce rain		
16. (i) Choice of two types from plain/plateau regions	1	
(ii) Showing difference in rainfall and relating it to difference in vegetation types	2	
(iii) Examples of trees/plants to illustrate difference	1	

Sl.	Objective	Specification	Unit	Form of as	Marks Alloted	Estimated Difficulty Level
1.	Knowledge	Recognizes	III	O	1	C
2	"	"	II	O	1	C
3.	"	"	I	O	1	B
4.	Understanding	Compares	IV	O	1	B
5.	"	Draws relationship	V	O	1	A
6	Knowledge	Recalls	V	VSA	1	C
7.	"	"	VI	VSA	1	C
8	"	"	III	VSA	1	C
9	Skill	Fills the map	III	VSA	1	C
10.	"	"	IV	VSA	1	B
11	"	"	II	SA	2	C
12	Knowledge	Recalls	I	SA	2	C
13.	Understanding	Gives reasons	I	SA	2	B
14	Application	Selects relevant facts	III	SA	2	A
15.	Application	Analyses	V	SA	2	A
16	Understanding	Explains	II	E	5	B

O . for Objective type
VSA for Very Short Answer Type
SA for Short Answer Type
E for Essay Type

A Difficult
B Average
C Easy

CHAPTER IV

Tools and Techniques of Assessment in Geography

Purpose of Assessment

Commonly the purpose of Assessment has been to report the performance of the pupil. While agreeing that this is not the only purpose it continues to remain important, in practice The two other purposes diagnosis and guidance often recede into the background because they do not immediately serve the selective function, as reporting does.

Obviously the selection of assessment procedures depends on the approach to the recording and reporting of achievement and often takes very essential considerations only into view, for saking detail and diagnosis for the sake of clarity and comparability

The approach to assessment therefore has always been worked out in a compromise situation—continuous assessment (partly to monitor progress, but mainly to divide the terminal assessment for comparability, placement, promotion and screening) The continuous assessment remains a poor image of the terminal assessment, and is also used for ranking and comparing However the purpose of assessment is not only that of reporting but also for improving learning and teaching

Planning Assessment

There is every reason to attempt and use assessment to collect data in order to evaluate the learner for providing the best way to move forward A comparable procedure has been identified as that of, a missile, which "homes" in on the target, it does not move along the path initially planned or it but modifies its course in accordance with the list of compensatory movements it has been programmed to follow Though it is worthwhile to evaluate all types of learning the most reliable method is that of written examinations. This indicates that when planning, assessment procedures can be selected depending on the following factors

1 Purpose of training
2. Range of behaviours to be developed
3 Process of training

The determination of the purpose of training enables a decision to be taken on whether the assessment is for monitoring progress, certifying attainment, comparing groups or standards, purposive selection or one or more of these

The range of behaviours to be developed determines the context of the assessment whether it is to determine the extent to which cognitive, affective or psychomotor outcomes are achieved or compare the achieved standard with the expected standard The second decision to be taken in which aspect of learning is to be evaluated in more detail and for what purposes Finally it has to be decided what the expected standard of the performance is to be keeping in view the purpose of the training

The process of training whether self learning, self paced correspondence, with practical and field work, in hetrogeneous or homogeneous groups, decides the assessment procedures to be adopted

Techniques and Tools of Assessment

Familiarity alone cannot be the sole criteria for selecting the test The situation may warrant a paper pencil test, observation of examinees in action, analysis of a piece of writing or product produced in a workshop, inquiry from the examinees on the process used, problems faced, suggestions for improvement, attitudes and opinions

In all these techniques implicit, in the methodology of their development are four aspects The major aspect is that the qualities or attributes to be assessed must be *generalizable* The behaviour to be generalized must not be too trivial nor segmented There are two levels of generalizing *a limited focus measurement* which is useful if one assumes that there are only a few very important objectives which need to be measured and more elementary abilities are incorporated in it The other is when the situation has pre-requisite skills or sequential steps as in practical work which is termed the *specific focused measurement*

The management of assessment needs the selection of techniques assuming that the important behaviours are generalised Having surveyed the range of techniques available there has to be a clear decision about the best technique for assessing that quality. Since the quality of the response does not vary, using several techniques to assess a particular behaviour does not increase the reliability of the assessment it only leaves us with a vast amount of data from which no meaningful decision can be taken Efficiency therefore, lies in selecting the most functional technique and justifying its selection in the evaluation scheme by giving a pre-determined weightage to it

When defining the assessment specifications the learnability may be clear but the teachability or the observability of the behaviour may be elusive Care needs to be taken when defining assessment criteria so that there is no distortion of the quality being measured Decision on when the assessment technique is to be used in the instruction process, and the definition of each specification has to be done on an experimental basis and empirically verified, so that the placement or choice of the technique may be varied between groups periodically.

The next aspect of management is how the assessment data is received. For instance, if the multiple choice variety is selected the response is restricted and objective If a constructed response the quality of writing or speaking must be defined. In using the other techniques like observation, inquiry or analysis the quality of the expected response has to be delimited so that interpretation of the assessment results is possible

The last aspect to be indicated is the nature of scoring and the use. Depending on whether the result is to be a report on pupil performance, it has to be decided if a numerical grade, score, range, or qualitative description is to be used If a variety of techniques are used whether the scores on each are to be added or reported separately. These questions are crucial because they decide if the assessment technique is functional or not

4 2 The Types of Assessment and Techniques and Fools Used

Evaluation is a continuous and comprehensive process and utilises a variety of procedures depending on the objectives of the syllabus and the outcomes of instruction ascribed to it The choice of the techniques of assessment depend on the nature of the subject, purpose of assessment whether for improvement or placement, diagnosis or certification, formative or summative and the stage whether at elementary or high school.

In the Social Sciences particulary Geography the objectives of teaching the subject are clearly more information specific at the elementary than secondary stage At the elementary stage emphasis is on the world and the variety in it, based mostly on descriptions and examples drawn from different countries Concepts of shape, form, size, movement, distance direction, location are introduced to the learner At the secondary stage the level at which these concepts are expected to be learnt becomes more elaborate. The immediate environment, observation, analysis and evaluation of Geographic processes in it become the main training component of Geography, how to describe and interpret maps, topography, patterns and not descriptions and geographic conditions are expected to be developed (Bloom, Madaus and Hasting, 1971)

Thus the learning outcomes expected suggest the evaluation technique to be used at the elementary stage for instance paper pencil tests, observation of pupils interests in countries of the world, information regarding pupils interests and knowledge from course work given are some common techniques used At the secondary stage projects, field work, practical, and tests are more suited to collect data for assessment

The principle consideration when selecting the evaluation technique to assess are clearly the

1 Requirements of learning geography at the stage/elementary secondary
2. Processes of thinking whether information, understanding information, relationships or analysis of information
3 Skill involved whether only cognitive or manipulative or both
4 Expected use of the result whether for placement, improvement, diagnosis or certification

The next question is whether a variety of techniques are at all necessary for assessment of learning? At present all the above considerations are being served by using the written test technique only However, it is clear that the use of the testing technique alone does enable a decision regarding pupil progress to be made, but it does not always explain why some pupils do not achieve well in them. It is here that analysis, observation and review techniques allows several types of assessment data to be collected and a more wholistic judgement to be made

Further, each of the techniques have as distinct advantage for assessing different objectives and hence need to be used selectively if comprehensive assessment is to be done.

When using the several variety of tools available for each technique it is important to make sure that the teaching situation does not become trained to the test, improvement of pupils by testing take precedence over high marks in the test alone Judgement based on test results are interpreted in the context of the objectives of teaching the subject not individual's capabilities only.

TABLE NO IV 1

Chart showing the Relationship between Objectives and Evaluation Techniques

Sl No	*Objectives and specific learning outcomes*	*Techniques of collection of data for evaluation*	*Tools of Assessment*
1	2	3	4
1	**Knowledge of Information**		
	1 1 recall	1 Testing	1 1 oral tests
	1 2 recognition		1 2 written tests
	1 3 reading graphs tables		1 3 practical
			2 1 checklist
			2 2 object test
		2 Observation	2,3 rating scale
2.	**Understanding**		
	2 1 of terminology, vocabulary	1 Testing	1 1 written tests
	2,2 of fact principle generalization		—Essay
	2 3 explains relationships, processes procedures		— Open Book
			— Assignment
		2 Analysis	2 1 project report
			2 2 assignment
			2 3 Topo sheet interpretation weather maps
			2 4 checking/ rating scale
		3 Observation	3 1 Anecdotal
			3 2 record observation scheduled
3,	**Application/Critical Thinking**		
	3 1 identifies problem	1. Observation	1 1 rating scale of project discussion
	3 2 selects appropriate variables to explain and define the problem		1,2 rating scale of project group planning
	3 3 uses the methods and procedures that are relevant to analyse the problem		1 3 checklist on field work procedures.
		2. Analysis	2 1 Assignments
	3 4 analyses the problem and reason		2 2 product evaluation of model, map, proposal
	3 5 suggests limitations and drawn conclusion	3 Inquiry	3 1 interview schedule for for field work, group work
			3 2 interview for field work, problems faced and methods used

1	2	3	4
		4 Testing	4 1 structured Essay Question 4 2 openbook exam
4	**Skills—Practical and Manipulative**		
	4 1 drawing, labelling and map filling	1 Observation of field work	1 1 checklist
	4 2 preparing models, maps, survey	2 Analysis of practical outcomes like drawings, reports etc.	1 2 rating scale
	4 3 collecting samples, labelling, display.		2 1 product scale
	4 4 using instruments		2 2 pupils self rating on a given scale

The choice of the techniques of evaluation are specific to the purpose of evaluation The table above lists the techniques and the types of evaluation methods for which these are best suited The simple consideration for such classification is its educational relevance, and as such can be used flexibly in the class room situation.

The techniques of assessment can be classified into those related to observation, inquiry, analysis and testing. These techniques are classified according to the mode of collection of information and the conditions of their use. Tools may be common for the techniques but the periodicity and situation of their use varies. The following chart explains the variety of tools available for each technique and the advantages of the technique themselves

4.3 Observation

The collection of data by observing pupil behaviour and interpreting pupil progress is a very commonly used techniques in class The main consideration is that the data is to be collected when the behaviour is observed, reported over a period time and described in sufficient detail to permit analysis.

This technique is best suited for collecting data for the following purposes

1 identifying pupils individual errors
2 diagnosing the cause of the mistake.
3 recording progress on behaviour changes which are internalised over a long time

The tools available for collecting the data are illustrated below ·

1 Anecdotal record . is a description of particular behaviour which is unique in each child To arrive at analysis sheet the behaviours are listed as shown below and the behaviour depicted by each student noted

Purpose and Use of Techniques and Tools of Evaluation

Sl No	*Technique of Evaluation*	*Purpose of Evaluation*		*Information collecting alternatives [Tools]*	*Advantages and Disadvantages of the tools*
1	Observation	Continuous, Formative Informal, Process	1 1	Standard observation	1 1 Presence of the evaluator may change environment but observation is child specific (Inter and intra observer reliability is low
			1 2	Longitudinal/covers sectional time sampling observation	
			1 3	Project/Field work observation of work attitudes schedule	
2	Inquiry	Formative, Summative, and of course, Process	2 1	Oral test	2 1 Can be administered to a large group produces objective data and reduce interpretation problems The disadvantage is that the child has to learn to read and is limited to the predetermined categories
			2 2	Questionnaire for student	
			2 3	Reaction sheet with rating scale	
			2 4	Ranking scale of statements according to priority by student	
			2 5	Group Discussion/Debate	
	Product/Process	End of course, summative, continuous, formal	3 1	Product rating scale	Closely related to real world situations and inexpensive to use But being individual based and product base requires quality on a given task time and canot be used for large classes
			3 2	Checklist of steps in a procedure	
			3 3	Checklist of performance	
			3 4	Practical Test	
			3 5	Assignment project	
	Testing	Formative, Summative, during course, end of of course, product, terminal	4 1	Examination question paper	The cost is low, the information can be processed afterwards and is at the standard taught useful for large groups, and easily interpretable The disadvantage is its poor quality, difficulty of comparison Subjectivity of scoring and difference between groups in performance
			4 2	Unit Test	
			4 3	Standardized Achievement Test	
			4 4	Pratical Test	
			4 5	Oral Test	
			4 6	Homework assignments or essays	

Pupils

1	2	3	4	5	6
1 Collects specimens of soils from the areas identified on the map in separate packets					
2. Arranges the specimens according to colour size of grains and porosity					

3 Observation Schedule

After doing a project there could be a discussion organised, the assessment of which can be done using a observation schedule as given here

Specification of Assessment of a Group Discussion

Observation Schedule

Main area	*Key to symbol*	*Analysis of the behaviour expected*
1. Content input for discussion	CI+	States the data base, sampling procedure and hypothesis that were tested and the conclusions arrived at in regard to the subunit (i e soil conditions and farm manure use) in which included
	CI—	Ignores significance of data base, comments on the whole study and contradicts conclusions already reported
2. Process of discussion	PD 1+	Identifies main issue first and lists aspects considered unnecessary.
	PD 1—	Reports in narrative all the events that occured
	PD 2+	Illustrates conclusions with examples from the study
	PD 2—	Gives conclusions without examples from study
	PD 3+	Synthesises a common theme or argument from several related particulars

3 Value judgements and personal positions	VJ 1+	Identifies irrelevance in or argument
	VJ 1—	Unable to sift relevant from irrelevant ideas in discussion.
	VJ 2+	Shows ability to accept others argument and refute using correct examples.
	VJ 2—	Shows lack of understanding of others opinions and insists on one's own argument
	VJ 3+	Makes a positive contribution to the trends of the argument in the study.
	VJ 3—	Makes ridicule of others opinion and negates all arguments
	VJ 4+	Shows appreciation of the relationship between opinion and social situation
	VJ 4-	Adopts a stereotyped attitude that social behaviour cannot be modified at all

4.1 Oral/Aural Test

In every classroom oral questioning forms a quick and easy method to recapitulate and review the lesson. The aspect being assessed here is that of expression, and communication In Geography map reading and survey operations as also descriptions of lands capes during excursions warrant the use of oral questions. In the elementary and even high school debates and discussions on aspects of geography—environment, pollution, resource conservation, ecology require the use of assessment of oral presentation.

In such tests the use of observational techniques is very necessary for assessment. The tests can be based on a stimulated situation in Geography, pictures showing manland relationships Or map reading and comparisons with photographs.

The testing purpose of each of the techniques are :

Testing purpose

1 To identify spatial factors that influence the decisions from the sectoral (economic, social etc) angle.
2. To predict the outcomes of changing the locational decision
3 To propose the plan conditions which alone will improve the situation

Simulation game.

The Mewat region on the Indo Gangetic divide has mostly rocky country. The soil is sandy and underground water brackish 20% of the total cropped area is irrigated. Floods and droughts occur every year.

In such a condition the priorities identified by the Development Board for expanding agriculture are

1 Plant protection and insurance scheme
2 Deepening of tube wells
3 Conservation of slopes of hills
4. Use flood water for irrigation
5. Construction of new canal

Select one as the main priority and present your view of why it is necessary to undertake this work first and others are not economical.

1. Simulated Geographic Situation

Assuming that the rules of the procedure are well known the pupil's positions asked during the game could be marked on a number scale as follows:

1	Choices explained in regard to spatial relationships	3
2	Predicitions made regarding changing locational decision within reasonable accuracy	3
3	Plan priorities identified using both Geographic and economic factors	3
4.	Choices explained only with sectoral relationship and spatial link not seen in instances	2
5.	Predictions regarding changing locational decision not related nor possible to situation	2
6.	Plan priorities identified using only economic factors	2
7.	Completely unsuitable response	0

2. Geographic pictures, maps, topographical sheets, models, sketches

It is assumed that the test will consist of a talk on the given question based on the materials suppled, map and photographs of the same area, or maps of topography. The questions could be thematic, narrative or explanatory.

Thematic

Soil degradation is a man-made feature in most of the Himalayas, illustrate with examples

Narrative

Location of rural settlements in plain areas are compact and at water points. Using locations shown on the map support or disprove this statement in a 2-3 minute talk

Explanatory

Why are the fields in any given photograph of Denmark rural area interspersed with canals when the rivers and sea is so close by? What conditions limit agriculture in this area?

The pupil will speak for 2-3 minutes and then the examiner can ask questions on further details of what has been reported or aspects that have been ignored by the student.

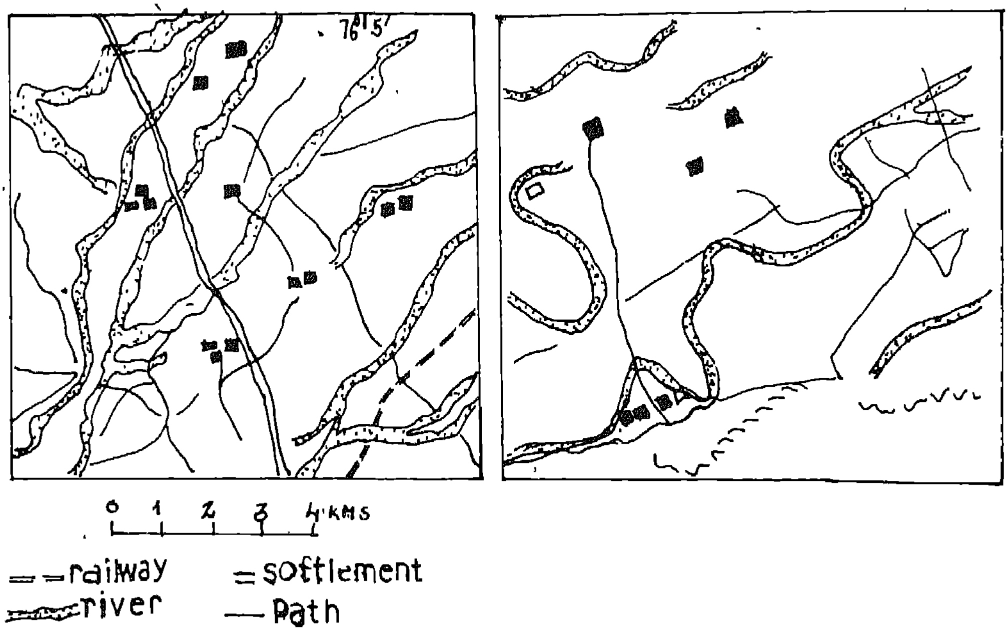


FIG 8

The rating of the pupil then is on the comparison to other pupils of the group on a scale which is

4 above average 2 average

1 below average 0 below average

depending on the fulfilment of the following requirements

1 geographic understanding

2. use of geographic terminology, ,direction,

3 perception of spatial patterns, linkages, accessibility distributions, from maps, photographs etc

Similarly observation techniques are used when pupils are undertaking a chain and take survey for example Here too a checklist of the procedure can be used as a observation list and each pupil's fieldwork can be assessed. Observation as a technique of assessment with the tools available like checklists, observation schedule, rating scales are useful for assessment of course work and partical work in the class-room field or laboratary Both formative and summative evaluation, but mostly periodic and process evaluation is best possible with this technique.

Inquiry

The technique of questioning (inquiry) to collect data is fairly common in social science data collection Its use in pupil assessment is mainly for the following purposes.

1 identifying attitudes and values to social problems Extent of geographic perception and concern for environment

2. diagnosing difficulties in understanding specific basic concepts needed for geography
3. cross verifying pupil's ability to consult references is geopgraphy, atlases, data sources etc

The tools available for the collection of data through inquiry can be the interview schedule, questionnaire or opinionnaire The main purpose is that the answer noted is a faithful recording of the pupil's statement and not the assessor's view

The limitation with the inquiry method is that the data is best used to find out what the problem or opinion is, not judge whether it is adequate, correct, acceptable and use it for ranking, determining achievement or placement

Whether a trait or attitude is there or not No ranking or rating of the pupil is possible These inquiry techniques help to decide the types of limitations that the learner has and accordingly plan the instruction or corrective action

The purpose of testing for each of these tools as suggested are

Tool	Purpose of testing	Assessment procedure
Questionnaire	1 to judge extent of concern 2 decide what responsibility to give 3. define the extent of limitation for making judgement regarding progress.	1 Project work allocation of group responsibility 2 Field work—to judge extent of concern for social problems —to identify problems of data collection 3 Assignment —to judge pupil preferences to evaluate a travelogue, do literature survey, prepare newspaper report.
2. Attitude scale	1 to identify pupils concern for the environment and attitude to other nations' development problems	1 Courses work assessement 2. Group work for exhibitions or model making practicals.

The following exmaples would indicate how these can be used in Geography assessment

1 (a) *Questionnaire Response Sheet*

Questions (See questionnaire)	*Yes/No*	*Example from the work done*	*Remarks of or/ teacher*		
			Moderate	*Good*	*Creditable*
1					
2					
3					
4					
5					

Signature of assessor ———————————————— date ——————

The student is required to answer the following questions. as Yes or No, and if yes give the example from the work done (Project, assignment, field work, excursion report etc).

Questionnaire

METHOD AND PROCEDURE OF SURVEY

1. Is the nature of the problem given to you now clear? If yes how can it be delimited
2 How many references to secondary data have been made and to collect what date?
3 Were any other similar studies or books on this problem referred to? If yes than which of these were used mostly
4. Were there problems in preparing the questionnaire and at which stage—development, tryout or finalization?
5. Were there limitations which were encountered in the field or during the conduct of the study? What were the main reasons for such limitations?
6. Are there certain aspects which were overlooked when planning the study? Could these be incorporated. Illustarate what and how these were incorporated?
7 Was the time schedule modified? At what stage and why?
8. Have the recommendations made in the study been verified? How many are acceptable to the target, planners, local authorities? Illustrate with examples?
9 Would certain aspects of the study made require further investigation? Which one would you find relevant to pursue?
10 Should this study results be used? Would the present situation have to be completely altered or can it be done within the present constraints?

I The responses as they are received as yes or no get a score of 1 and 0. Further the affirmative answers can be graded on three points depending on whether the response is Moderate, Good or Creditable The total score can then be aggregated and averaged for all the questions in order to rate the students

II. The following tool of general awareness can be used in order to assess the sensitivity, geographical perception, sympathetic understanding of spatial problems, understanding and concern for environmental increasing population, conservation and renewal of energy resources

Questionnaire/Awareness schedule:

1 In undertaking a survey of the most commonly used mode of travel the selection of survey points in the city could be based on

2 most important

3 In developing countries environments depletion is dependent on which of these factors in your opinion?

3. most important

4. In your opinion which of the given factors contribute to economic development in the North East of USA which were absent in Western Eruope?

most important

5 most important

6. Depletion of natural resources particularly fuels in your opinion can be stopped by what controls?

6 most important

Questionnaire/Awareness Schedule

1 Answer the questions given below by selecting the possible factors that answer the question list, its number and in the circle? Write the number of the factor whicc you think is most impaortant

2 Not all the places need be filled The same factor can be used for more than one problem

3 Answer the questionnaire in 40 minutes

Factors

Factor may appear in more than one answer

A closeness to city centre
B density of residential areas
C traditional market areas,
D cost of product in the economy
E demand for necessity
F absence of regional planning
G accesses to raw material
H lack of alternate agricultural land or occupations
I overcrowding of industrial activities
J selection of energy only from renewable sources
K increasing agricultural/and areas
L growth of suburbs and urban ribbons
M industrial areas and commercial centres city periphery
N dependence on exports of raw materials for finished goods
O high increase in population
P reliance on industrial locations or near raw materials
Q residential areas at the city lived in by middle and working class population

The inquiry techniques are clearly meant to elicit information from pupils which would otherwise not be revealed in the course work or examinations since these are personal opinions Use of the inquiry technique is only possible where the learner can make choices or ratings. Preferences, being conditioned by the situation planning for opinion development has to form a part of teaching before any assessment of it can be done

Analysis

The use of analysis techniques for assessment allows for looking at the end product and judging the quality of the process. This technique is frequently used for assessing essay type answers, reports of projects and field excursions, practical note books and survey analysis sheets

This technique is useful for both formative and summative evaluation during and at the end of course work

The rating scale for product assessment, checklist, impression marking scheme for a essay type answer, or a sample course work assessment sheet used in external practical test are examples of tools using the analysis technique

Examples of the rating scale, marking scheme and report evaluation sheet are given here as illustrations

Example 1.

Marking Scheme

Question

Select a country which has a marine west coast climate and illustrate how far environment has been modified for development of agriculture

Marking scheme

When rating the answer the marks awarded will be allocated as

1 Content input	3
2. Applicability of illustrations	3
3 Relevance of explanations	2
4 Organisation and use of geographic terminology	2
	Marks 10

Example 2

Rating scale for evaluating a product (Project report, assignment, field work, excursion reprot)[2]

	Aspects	*Evaluative/ Rating*	*Criteria*	
1	2	3	4	5
1	*Presentation*	Good (3)	Average (2)	Poor (1)
1 1	Is the material indexed and paged with illustrations marked ?	—	—	—
1 2	Are the diagrams, maps, following simple conventions of cartography ?	—	—	—
1.3	Are the references alphabetically arranged and complete?	—	—	—
1 4	Are the chapters/sections related ?	—	—	—
2	*Research*	Clear (3)	Adequate (2)	Insufficients (1)
2.1	Has the observation and data collection method and sample been stated ?	—	—	—

1	2	3	4	5
2 2	Are the tools used and statistical methods reported	—	—	—
2 3	Are the quotations & hypothesis clear.	—	—	—
3	*Content*	Systematic 3	Sufficient 2	Haphazard 1
3 1	Is the problem defined and scope of present study indicated	—	—	—
3 2	Are the arguments and interpretations possible and relevant based on the available data	—	—	—
3 3	Is the conclusions valid and related to the hypothesis formulated	—	—	—
3 4	Are the descriptions correct	—	—	—
4	*Conclusion*	All 3	Most 2	Some 1
4 1	Are the conclusions possible	—	—	—
4 2	Are these verifications proposed.	—	—	—

R N Deale (1975) Assessment and Testing in the Secondary School Schools Coucil Examinations bulletin 25 Evens Methven Educational P 77

Another tool available for analysis is a checklist The following example enables an assessment of the extent of geographical understanding a pupil has developed

Example of a checklist for pupil preparation for an excursion

You are required to undertake an excursion to observe the physical and economic features of a river What maps will you make and what data out of the following will you choose Tick against the best

(a) interviews with boat men and local people on the use of river
(b) 1 25000 topographical sheet of the river.
(c) sketch from a photograph of the river features
(d) notes on observation of the river's features
(e) sketch of the area including physical features and man made uses.
(f) impressions about the visual problems of pollution, silting, flood hazard etc
(g) drawings of local boats and cargoes being carried
(h) wages and living conditions of boat men
(i) questionnaire on the background of the river in the history of the area
(j) land use maps showing settlements.
(k) 50m contours shaded to show heights and features of the river
(l) map showing roads and paths and routes to the river

The use of analysis techniques after testing is very useful for evaluation Assessment of field report book and field work both need analysis techniques to be used It is desireable to assess both aspects practical skills and the record of field work together with conclusions and interpretation of results as given in the field report The present view can be best tested in the written test is a very partial one

Tools and Techniques of Assessing Written Examinations

Use of written examinations is mainly to measure the mastery of intellectual skills, and whether specified set of facts or generalizations have been learned

Objective type, short answer and essay type questions are the most commonly used tools. The writing of these questions requires the defintion of the instructional objective from which the task/situation for the item/question is derived and selection of the best form is made

The different forms of questions are used in order to effeciently evaluate the objectives Below is a table clearly indicating the distinct advantages of the different forms to test various objectives

Course Objective *Form of Question*	*Understanding relationships trends, generalization*	*Explaining illustrating summarising*	*Listing, comparing, calculating, interpreting*
Essay Type			
Structured Long-Answer			
Short Answer			
Multiple Choice			

However this categorization is not inflexible because multiple choice questions can test all the objectives with ease There are several uses to which questions are put both in instruction and evaluation In the latter an attempt has to be made to make the scoring as reliable and valid The marking scheme in the case of the constructed answer type is a typical example. The weightages to aspects for a essay like content, presentation, organistation, spelling, handwriting and style are all specifications for evaluation and have to be defined for rating purposes.

The advantage of the written examinations are that the data on pupil achievement for each objective can be ascertained, questions can be selected for a test such that the test results enables the classification, selection, or placement by calculating item facility and discrimination indices and only retaining certain items

Limited as the technique of written testing is, only to the assessment of cognitive abilities, its ease of construction, functionality for large group testing, impersonal assessment, ease in evaluation, result in the written examinations becoming further and further refined and effective as a technique of assessment for all situations

3.1.3 Techniques and Tools for Assessing Practical Work

Wherever the major instructional objective of the course is analysed into specific tasks which requires the acquisition and development of manipulative, experimental, observational and recording skills to illustrate the theoretical aspects, practical work assessment has to be planned for

It is important to decide what tools to select to maintain a congruence between the stated goals and the truly desired outcomes. As a result evaluation data is not available for taking the most pressing decision and the strong willed intuitive decision makers pass the judgement.

The objectives of practical work are usually identified as

1. skill in observing and the recording of observations
2. assessment and interpretation
3. devise critical experiments
4. possess appropriate manipulative skills
5. scientific attitude to work

The selection of the tool for each of these abilities are best undertaken by listing the purposes of assessment and deciding whether the technique is to be observation, review, inquiry or analysis and for each whether the tool is to be a checklist, rating scale, test, questionnaire, interview schedule or attitude inventories.

The development of a checklist is the first step which is easily done by doing a job analysis The completion of each task enables the rating of the attainment.

Deciding the entry level requirement and defining the performance criteria for each task that has been identified as well as rating the task as important, difficult and routine allows the development of a rating scale. The rating scales can be used to collect data for observation and analysis of product in practical work

In collecting data for the assessment of practical work therefore any of the following tools could be used

Observation of students conducting set exercise of practical work

Give students checklists of the requirements and procedures sequence to conduct an experiment

give questionnaires on the use and purpose of the experiment conducted.

Interview students on questions related to the experiment/practical work conducted.

Apart from this written self reports could also be collected Questionnaires and opinionnaires are best used to assess the cognitive processes Whereas the rating scale and ranking of options according to priority enable efficient data collections on scientific attitudes, interests and extent of habit formation Detailed discussion on these aspects are taken up later also

4.0 Conclusion

Keeping track of learning, and probing for a way forward makes assessment necessary for evaluation. In order to collect evidence several tools are available depending on a specific technique of assessment that is selected.

A careful planning of the mix of assessment techniques and the tools to be used should indicate the weightages, periodicity and use to be made of the evidence collected It is only by such conscious effort that the present dependence on only the written examinations can be countered and purposive evaluation for formative and summative purposes be differentiated

CHAPTER V

Written Examinations and Tests

The use of the two terms "test" and "examination" is made because the test refers to a particular situation set up for the purpose assessment, a unit test, homework assignment, essay questions are all tests whereas an examination refers to a large scale test or a combination of several tests written and practical usually evaluated comprehensively by another teacher and conducted by a specialized examining agency or Board

When considering the methods of preparing a written test or an exam principles basic to testing are used The planning of the test and the written exam is the first step Secondly contruction of valid questions covering objectives of instruction and the content inputs and finally to ensure reliable marking the preparation of marking scheme and use of test results for decision making

The use of paper pencil test and the written exam are different from that of the observation and review techniques discussed in the previous chapter in that these are meant mainly for

1 discriminating between pupils who have achieved the expected standard from those who have not
2 Compare pupils with each other and with the group
3 Compare the previous and present achievement of the pupil in the same subject or in other subjects Whereas the techniques discussed earlier are useful for evaluating the process of learning or values developed during instruction

5.1 Unit Test, its Planning and Use

What is a Unit Test?

A unit of study may be understood as a block of closely related bits of subject matter as it can conveniently be overviewed by the learner The size of a unit will vary from stage to stage depending upon the mental maturity of the learner and depth at which a particular study is being undertaken For instance, Physical Geography of India may be a Unit of study at the lower elementary stage which is taught over a period of a week or so but at the secondary stage just, climate of India may constitute a unit of study taught over a duration of nearly 10 days. At the college stage, the summer Monsoon itself may be taken up as a separate Unit of study The Central idea around which a Unit of Study is developed may either come from the subject content, approach of the content or even pupils own interest or experience Commonly, the salient topics or themes drawn from a subject area or prescribed syllabi become the basis of units of study A number of Units of study constitute a course of study. A formal test is held at the end of a course of study or a major part thereof to as certain the progress made, particularly with a view to grading and certifying the student achievement. It is necessary to test the progress of learning at each stage, mainly with a view to finding out whether a certain piece of learning has been achieved before starting the next unit.

1 *Assessing the progress of learning*

The evidence about attainment so obtained will provide a clue as to how the class or an individual learner is progressing

2 *Guiding to the teacher in planning his instruction*

The teaching of a subsequent unit depends to great extent on the earlier learning An idea about this likely to help the teacher in planning or modifying his proposed instructional plans in many ways

3 *Motivate the learner*

A test is a challenging task and hence it is likely to serve as a good incentive Since the Unit test is informal, it is not accompanied with the usual exam tensions since such tests occur frequently

4 *Self-evaluating device*

If need be, a unit test can be given to students to try it on themselves Since it contains the answers in the key and marking scheme, they can check their responses against them There can be a number of unit on the same topic The teacher may pass on some of them to students for such review.

5. *Use as home assignments*

A part for whole of the Unit test can be set as home assignment too As such the Unit tests serve as ready test material with the teacher.

6. *Use for correcting learning mistakes*

A Unit test is a carefully developed teacher-made test. It is objective-based and its potential is known Such a material can serve as a type of remedial exercises.

7 *Use as a teaching device*

Questions in the test are basic tools in teaching They are used variously e.g to initiate lesson task or basic problems, as a pre-test, review, development of themes and the like The Unit test contains well choosen questions from which teachers may select as and when the need arises

Framing of questions presuppose a fair degree of achievement in the subject matter concerned It may be a very fruitful exercise to invite questions from students along with outline answers These may be taken up for discussion and comment in the class

5.2 Preparation of a Design and Blueprint of a Test

1. Preparation of a design

The design is not only the first, but also the most important step of paper setting It lays down the chief dimensions of the question paper

2. *Weightage to objectives*

This means the selection of objectives desired to be tested and allotting marks to each, in view of its importance. This will help reduce emphais on memory and enable the testing of higher abilities

3 *Weightage to different areas of content*

This is done by doing an alalysis of the syllabus, and delimiting of the scope of each topic in the first instance and then the alloting marks to each of the major areas for the purpose of framing questions

4. Weightage to different forms of question

Working on the principle that for testing a particular ability and content the most suitable form of question should along be used, we may like to choose different forms of questions for inclusion in the question papers instead of just one form viz the essay type question Having made this decision, the marks to be allotted to each type of question have also to be decided

5 Scheme of options

The design may also indicate the pattern of options, i e. the complete elimination or overall options and the limited retention of internal options, which among themselves may be comparable in respect of the objective to be tested, the major area of content covered, the form of the question, the difficulty level of the question, etc

6. Section in the question paper

The inclusion of objective type questions may necessitate the division of the question paper into parts and the allotment of separate time limit for answering each Theses questions are usually answered in a shorter time and need not remain with the pupils for longer than for the time necessary for answering them In view of the above considerations the design may suggest the division of the question paper into two sections, both to be administered one after the other, but the one containing objective type questions may be collected at the end of the given time limit

7. Preparation of a blueprint

A blueprint gives the details of the design in concrete terms. It is a three dimensional chart giving the placement of the different questions in respect of

(1) the objective tested by each,
(2) the content area covered by each,
(3) the form of question which is most suitable for testing 1 and 2 above

In addition to the above three dimensions the blueprint may also indicate

(1) the numerical weightage to each question individually, and
(2) the scheme of options to be adopted in framing the questions.

The blueprint is thus the detailed plan based on the design for preparing a question paper.

Steps in preparing a blueprint

(i) Insert the total marks in the bottom right hand corner box as indicated by (a) in the blueprint (100 in this case)

(ii) Then decide about the essay type questions which could be given only where weightage to a sub-unit is sufficient enough and the content demands a long answer question Moreover, certain essay type questions do include a part of it requiring students to draw diagram as a part of the same question. In such cases the marks set apart for skill part of the essay question under the skill column in the same row against the same sub-unit as shown in sub-unit-2(2 marks for skill) This helps the teacher to apportion the remaining weightage of skill objective to other quesitons to be set for testing skill Figures inside the bracket indicates the number of questions to be set and figures outside indicate the total marks for the question/s. In the sample unit against sub-unit-2 under Essay type 17 marks + 3 marks for U and Skill are shown Since skill part is included in the same quesiton the number of questions is not shown e.g. 3(—), in column 'E' under skill objective, so, that only one question is represented in the blueprint without affecting the total number marked (B) in the blue print)

(iii) Next step is to fill in the skill column so that whichever sub-unit is more amenable for testing a drawing skill, could be used for alloting skill based questions. Sometimes it is necessary to frame a full-fledged questions testing skill independently. This is possible only if we first explore the possibility of identifying sub-unit which admits skill based question as indicated against sub-unit-3 under S.A column of skill objective marked (C')

(iv) Once skill questions are inserted then proceed to allocate application questions. Simple reason for this is the inherent difficulty of framing such questions on every sub unit. Therefore, we should identify the relevant sub units which have more potentiality than others for framing questions testing application. This prevents difficulty which may arise later in converting knowledge or understanding question to that of Application question which is not always possible Likewise content elements in that particular sub-units may be more amenable to multiple choice than short answer variety of question for testing Application objective. Sometimes all the sub-units could be used for testing Application objective although they may not admit all forms of question marked (D')

(v) Once the distribution of Skill and Application question is over the task becomes easier as coversion of knowledge based questions to that of understanding or vice-versa is no problem Nevertheless, it is suggested that we may now proceed subunit-wise making entries simultaneously under Knowledge and Understanding objectives Care has to be taken that decision about allocating objective type questions should precede short answer quesitons. Likewise distribution of questions under the objective 'Understanding' should precede the knowledge objective so that choice of content element could be made for higher level objective in precedence to lower level objective. Thus entries in all the sub-units are made sequentially as shown in the sample test [marked as (e)]

(vi) More often than not, some adjustment about distribution of questions under knowledge and Understanding objective, becomes necessary to one sub-unit or two to ensure the correct weightage to sub-units and objectives. This is inevitable unless one deliberately goes ahead keeping in view only the adjustment of marks and not the content elements of the sub-units.

(vii) Insert row-wise and column-wise sub-totals indicating the number of questions and the marks for those questions Check the totals on both the sides to see that it is the same blueprint is now ready

(viii) Check whether in the blueprint the questions are well spread over the various sub-units and are not crowded at one place. See that by and large different units are not restricted to only one type of questions only although in a particular sub-unit it might be inevitable.

5.3.3 Preparation of Questions Based on the Blueprint

After the position of different questions is located on the blueprint, the next step is the preparation of questions, the dimensions of each of which have already been defined on an individual basis in the blueprint. By taking each location on the blueprint, individual questions have to be framed to satisfy the requirements of the respective positions The framing of questions based on the blueprint would necessitate the knowledge of objectives and specifications, a mastery over the subject matter and the skill in framing different form of questions.

While writing or selecting questions for the paper it may be kept in mind that the question:

(1) is based on a well-defined specific objective of teaching;
(2) relates to a specifice content area;
(3) is written in the form as required by the blueprint and satisfies the rules for framing that form of questions,
(4) is at the desired level of difficulty,
(5) is so worded as to be well within the comprehension of the pupils and to clearly indicate the scope and length of the answer,
(6) is so translatable that its scope, meaning and difficulty level do not change in'the translation, and
(7) has good discrimination value

5.3.4 Editing the Question Paper

Editing the question paper is a step of crucial importance It consists of the following measures:

(1) *Assembling the question* Assembling the questions into sections is usually done on the basis of thier form i.e the fixed response type questions (the objective type and/or the one word answer the very short answer type) may be put in one section and the free response type questions (the short answer and the essay type) may be placed in another section
Within each section again, there could be sections based on the content area divisions. Whether there are sub-sections or not the questions have to be organised in a graded order of difficulty.

(2) *The instructions to examiners·* The directions regarding what the students are required to do,need to be clear, specific and pointed General instructions may be given in the beginning of the paper and specific instructions related to each section in the beginning of the corresponding section

(3) *Implications for administration.* The editing has important implications for the administration of the question paper particularly in view of the division of the question paper into sections based on forms of questions it may be necessary to ascertain that there is no duplication of questions in the selections containing fixed response and essay type questions

5.3.5 Preparation of the Scoring Key and the Marking Scheme

Very often when we start thinking of the answers to particular questions we are able to discover mistakes in the questions, so it is essential to frame the scoring key and the marking scheme when framing the questions The scoring key is to be prepared for the objective type questions and the marking scheme for the essay and short answer and the marks that each point or aspect of the answer deserves In case there are more points than provided for in the marking scheme and the student has the freedom to choose only a limited number of them, we may indicate that any of the points given in the expected answer or similar other points given by them may be taken as correct. As far as possible effort should be made to give all the points that may be relevant to the question irrespective of the number asked for in the question. Detailed instruction for scoring will also need to be worked out and issued to the examiners

BLUE PRINT

Unit Oceanography
Maximum Marks: 100

Class: XI
Time: 2 hours

S No	Objective Content Unit / Form of Question	E Knowledge				E Understanding				D Application				Skill		Total
		E	SA	VSA	O	E	SA	VSA	O	E	SA	VSA	O	E	SA	
1	Ocean basins and submarine relief		5(1)	6(3)	1(1)		5(1)		3(3)							20
2	Movement of Ocean waters and circulation			4(2)	1(1)	17	10(2)	6(3)	3(3)		10(2)	2(1)	2(2)	3(-)	(B) 2(1)	60
3.	Marine flora fauna and deposits, Marine resources						10(2)				5(1)				(C) 5(1)	20
			5(1)	10(5)	2(2)	17(9)	25(5)*	6(3)	6(6)		15(3)	2(1)		3(-)	7(2)	
		17(8)				54(15)				19(6)				10(2)		100(A)

Notes· Figures withing brackets Indicate the namber of questions and figures outside the brackets indicate mark

*Denotes that marks have been combine to from one question

Summary			
Essay (E)			
Short Answer (SA)	No 13	Marks 65	Scheme of Section 2
Very short Answer (VSA)	No 15	Marks 30	
Objective (0)	No. 10	Marks 10	
	30	100	

This will ensure a high degree of reliability in scoring by an examiner and uniformity in scoring when many examiners value answer scripts

5.3.6 Preparation of the Question-wise Analysis

The question-wise analysis will enable us to know the strengths and weaknesses of our question paper more thoroughly. It will also give us a check to tally our question paper with the blueprint Eash question will be analysed in terms of the following elements:

(1) Objective tested by the question
(2) Specification on which the question is based
(3) Topic covered by the question
(4) Sub-topic covered by the question
(5) Form of the question
(6) Estimated difficulty level (Essay or Average or Difficult)
(7) Approximate time required for answering
(8) Marks allotted to the question

These details are given in a tabular form and each column of the table can be summarised to give us the distribution of questions either over the different objectives, or the areas of content or the forms of questions, etc.

The question-wise analysis can also be undertaken in a different number of questions at the places which they satisfy in respect of the dimension of the blueprint This would tally exactly with the blueprint and is the best way of checking that the questions fill the places located in the original blueprint

BLUE PRINT OF UNIT TEST

Unit. Oceanography
Maximum Marks: 50

Class XI
Time: 2 hours

S No	*Objective* *Content Unit* / *Form of Question*	*Knowledge*				*Understanding*				*Application*				*skill*		*Total*
		E	*SA*	*VSA*	*O*	*E*	*SA*	*SA*	*O*	*E*	*SA*	*VSA*	*O*	*E*	*SA*	
1	Ocean Relief				1(1)		12 3(1)				17 3(1)				21 3(1)	10(4)
2	Ocean temperature salibity		3(1)		1(1)		9(3)		1(1)	5(1)			1(1)			20(8)
3	Ocean movement and circulation				1(1)	5(1)					3(1)		1(1)			10(4)
4	Ocean resources and fauna						3(1)		3(3)				1(1)		3(1)	10(5)
		5(4)				25(10)				14(6)				6(2)		50

Notes Figures within brackets indicate the number of questions and figures outside the brackets indicate mark
* Denotes that marks have been combined to form one question

Summary	Essay (E)	No. 2	Marks 10	Scheme of Options
	Short Answer (SA)	No. 2	Marks 30	Scheme of Section
	Very short Answer(VSA)	No 10	Marks 10	
	Objective (O)	No 15	Marks 50	

Unit Test

Ocean water and their circulation and Marine resources

Class : IX

Time· 1 hour Max Marks · 50

Instructions:

1 Attempt all the questions.
2 In questions 1-10 write the correct answer in the bracket
3 Question No 11-19 are to be answered in about 50 words.
4 Question No 20-21 are to be answered in about 100 words

1 The occurrence of which feature supports the fact that lectonic movements have accrued in the deeper portions of the ocean?
  A submarine ridges
  B island area
  C guyots
  D Volcanoes ( )

2 The horizontal and vertical movement of ocean waters which changes the circulation pattern occurs where the density of water is
  A increasing
  B decreasing
  C equal
  D. unequal ( )

3. Maximum wave height is found in large oceans but not in lakes or bays because of more
  A. wind speed
  B depth of water
  C. length of fetch
  D Volume of water ( )

4. There is a higher difference between the *temperature* summer and winter temperatures of the Mediterranean Sea as compared to the Altantic because of
  A heat conducted from land
  B mixing of warm and cold current.
  C less volume of water.
  D small surface area of sea. ( )

5 Fishes are abundant on the east coast of continents as compared to the west because of the nutrients which are found here due to
  A vertical movement of water due to anticyclonic conditions.
  B mixing of warm and cold currents
  C. river water adding salts
  D obstruction caused by coast line. ( )

6. The continental deep·sea fauna is differnt from those found on the continental shelf or

slope in that these are

A specific to an area
B of a variety of species
C supplied with more food.
D. larger in size ( )

7. Which land based resource is also found more abundantly in ocean deposits

A Petroleum
B Iron
C. Diamonds
D. Manganese ( )

8. Which of the given feature of the continental shelf does not entirely support the explanation that it has been formed due to depositions of materials.

A Depth of the deposits.
B. Width of the shelf.
C. Steep slope of continental shelf
D Absence of the shelf in some areas ( )

9. The direction of movement of the currents in the experiment shown here will be

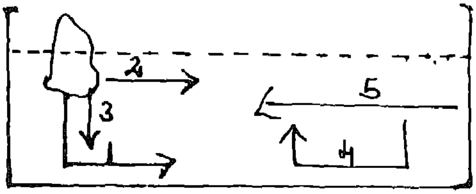


FIG. NO. 9

A 1,5
B. 2,3
C. 1,3
D. 4,5

10. Lying in most cases off the margins of continents Seismically and volcanically these are the most active and mobile features of the earth To which submarine feature does this description refer?

A midocean ridge
B. trench
C island arcs
D Seamounts ( )

11. Give two factors why the sea is called the great absorber and distributor of heat 3
12 Compare the features of theodbyssal plain with that of the mid ocean ridges 3
13 Explain why the annual range of temperature near the ocean is much less than over the land in the tropical belt 3
14 Why is the average salinity of the Pacific Ocean lower than of the Atlantic?
15 Illustrate why the N equitonal current is absent during summer in the Indian Ocean

16. List the areas and identify physical factors which contribute to the development of fishing areas in the world
17. What evidence supports the view that the mid oceanic ridges are very old and a major structure of the earths crust
18 Which factor causes the ocean currents to be stronger on the western side of the ocean than the eastern and how?
19 What significant differences are there in the circulation pattern of the ocean and atmosphere
20 What factors causes the sudden occurence of plankton, like in the sargasso sea or El nino current, in selected places.
21. In given map of the Indian Ocean Basin Bed mark the following features (i) Java Trench (ii) Mid Indian Ridge (iii) South Madagascar Ridge
22. On the given world map indicate the fishing areas which are highly productive.

Scoring Key

1	2	3	4	5	6	7	8	9	10
A	D	C	A	B	A	D	C	A	C

Marking Scheme

Sl No 1	*Expected Answer* 2	*Value points* 3	*Marks* 4
11.	i) The oceans are heated by the radiation from sun and sky conduction of heat back to the atomosphere and condensation of water vapour	1	3
	ii) The high insolation which is received at the Equator makes water light and the cold water near the Arctic and Antarictic sinks to the bottom The warmwater from the equator moves north carrying with it the heat. This process is called convection	2	
12.	i) The mid oceanic ridges are made up of igneous rocks with a large central rift In east and west directions faults also occur From these there is a continuous flow of passltic lava	1½	
	ii) In comparison the abyssal plains on either side are flat mostly sediment deposists In the pacific there are hills or volcanic mounts called guyots on which there is a only a thin sediment.	1½	
13	i) Annual temperature variation is lower over oceans than land because in the autumn and winter the surface of sea is cooled by the cold air As a result heat from considerable depths is removed and the surface temperature of the sea reduces very little	2	3
	ii) The ready small currents mix the waters		

1	2	3	4
	vertically spreading the heating and cooling over vast ocean areas So there is little annual variation as compared to land masses		
14	The average salinity of the Pacific is lower than that of Atlantic because the Mountain ranges of the continents like the Andes force the wet minds of the pacific to reduce their moisture, whereas there are no such barrier between the Atlantics water vapour which is carried across to the pacific by winds following across the panama	3	3
15	i) During May to September (Summer) the continent of Asia is warmed drawing air from the relatively cooler Indian ocean When this happens the north equatorial current is replaced by the SW Monsoon current	1½	
	ii) In (winter) (November to March) the air flow is from land to the ocean and the equatorial counter current is restored	1½	3
16.	Fishing areas in the world are developed where		
	i) the continental shelf is wide since this allows sunlight to penetrate and the river waters tend to retain the food produced.	2	
	ii) Mixing of deepwater with surface where the chemical nutrients are converted and plants can grow		
	iii) Such conditions are in subpolar subtropical and equatorial areas only	1	3
17.	The mid oceanic ridges can be considered the oldest structures of the earths surface because		
	i) these ridges are still growing today and that once formed these cannot disappear	1½	
	ii) Relatively none of these huge ridge are eroded or have stopped growing indicating their long history	1½	3
18	The earth rotation from west to east causes the defection of the ocean currents. Since the margin of the continents obstruct the movement stronger and narrower currents are	3	3

1	2	3	4
	formed on the west side of oceans than the east		
19	The difference in the ciruclation pattern of the Ocean from the atmosphere are		
	i) Oceans are heated, by the radiation convection of the of the sun on top of the water surface not the botton like the atmosphere	1	
	ii) The water is liquid and air is a gas so the friction is more on the sea surface	1	
	iii) Continents, mounts ranges bound the oceans but attitude plays a small part in affecting atmosphere circulation	1	
	iv) Whereas the changes caused by cooling, heating, pressure on ocean salinity temperature or density are only significant at the top whereas the whole atmosphere is influenced by each changes	2	5
20	The warming of ocean waters in equatorial regions and cooling them in polar regions causes a phenomena like the gulf stream which transfers the warm equatorial waters to the cooler Atlantic This causes the sudden occurrence of sea life called the sargasso sea which disappears once the warm gulf stream mixes with the colder Atlantic drift		
	The El Nino however is the occurrence of warm water flowing along the Peruvian coast preventing the upwelling of cold waters which have nutrients This causes the fish which feed on the phyto plankton to die	3	5
21	Locates the features	1 mark each	3
22	Locates the fishing grounds of South east Asia, West Asia western coast of Africa Japan new NE, USA, Central America contenta and western S America	½ mark for each 3	

Question-wise Analysis

S No	*Objective*	*Specification*	*Content*	*Form of Questions*
1	Knowledge	Recall	Ocean Relief	OT
2.	Knowledge	Recall	Ocean Temperature Salinity	OT
3	Knowledge	Recall	Ocean Movement	OT
4	Understanding	Gives reasons	Ocean Temperature	OT
5	Understanding	Distinguishes	Ocean Resource	OT
6	Understanding	Compares	Ocean Resource	OT
7	Understanding	Illustrates	Ocean Resource	OT
8	Application	Gives evidence to support	Ocean temperature	OT
9	Application	Hypothesises	Ocean Movement	OT
10	Application	Draws conclusion	Ocean Resources	OT
11	Knowledge	Recalls	Ocean Temp	SA
12.	Understanding	Compares	Ocean Relief	SA
13.	-do-	Gives reason		
14	-do-	Compares	Ocean Temp and salinity	SA
15	-do-	Discriminates		
16	-do-	Illustration	Ocean Resource	SA

O for Objective type	+A Difficulty
VSA for Very Short Answer Type	B Average
SA for Short Answer Type	C Esay
E for Essay Type	

S. No.	*Objective*	*Specification*	*Content*	*Form of Questions*
17.	Application	Establishes relationship	Ocean Relief	SA
18.	Application	Draw conclusions	Ocean Movement	SA
19.	Understanding	Compares	Ocean Movement	SA
20.	Application	Infers	Ocean temperature and salinity	SA
21.	Skill	Draws	Ocean Relief	
22	Skill	Draws	Ocean Resources	

O for Objective type	+A Difficulty
VSA for Very short Answer Type	B Average
SA for Short Answer Type	C Esay
E for Essay Type	

DESIGN

Subject · Geography | *Class* X
Time : 2 Hours. | *Max. Marks* : 60

I. Weightage to objectives

	Marks	*Percentage*
Knowledge	20	33.33
Understanding	22	36.67
Application	6	10.00
Skill	12	20.00
	60	100.00

II. Weightage to Content

General Geography of the World

	Marks	*Percentage*
1 The environment, atmosphere lithosphere	5	8.3%
2. Resources, types and distrilbution	3	5.0%
3. Man and Food Supply Case study of Industry and Agriculture.	5	8.3%
4. Human occupations Natural Regions	9	15.0%
5. Map study	3	5.0%
INDIA		
6. Relief climate. Vegetation	10	10.66%
7 Agriculture	8	15.00%
8. Materials and Industry	9	15.00%
Transport and Trade	8	15.00%
	60	100.00

III. Weightage to Forms of Questions

	No. of Ques.	Marks	Percentage
1. Very Short Answer	20	20	33.33%
2. Short Answer	8	32	53.33%
3 Essay Type	1	8	13 33%
	23	60	100

Sample Question Paper

Geography

Class . X

Marks : 60 *Time 2 hours*

General Instructions

I. All questions are compulsory.
II. Attach the map of world and India correctly folded in the second page of the answer book
III. Answers to one question and its parts must be given in sequence
IV Number the questions according to the serial order of questions
V. Answer to Q Nos 2(i) to 2 (x) are of 1 mark each should not exceed a sentence or a word or a phrase.
VI Answer to Q Nos. 3(i) to 5 of 4 marks each should not exceed 100 to 150 words each
VII. Answer to Q Nos 6 is 8 marks and should not exceed 250 words

1. (a) On the outline map of the world supplied to you show and label the following
i. a. One area of equatorial rain forest in Africa
b An area of Mediterranean region in Australia
ii. Two main countries of Asia which are very highly populated
iii Two petroleum producing countries in the middle east
iv. a. Kalahari Basin
b. Temperate grassland areas of S Amercia
1 (b/) On the outline map of India given to you locate the following
v. Malwa Plateau
vi. Thorn forest of Deccan Plateau
vii. One cotton growing area in *Northern* and one in *Southern* Part of India
viii One steel plant in Madhya Pradesh

ix Draw a simple scale of 1 cm to 1000 metres with primary and secondary division following question with the help of this scale
a. Show the distance of 3500 metres by drawing a line A-B
b. Draw a sketch map of a rectangular plot the length of which is 4.5 kms and breadth is 1 5 km using the scale 1 cm-1000 m.

2 (i) Name the hard land masses which were situated to the north and south of Tethys sea.
(ii) State the location of the areas which receive less than 20 cms of rainfall.
(iii) What is the average temperature and average rainfall required for the growth of paddy (rice) crops in the plains of Ganges river
(iv) What type of land is required for growing tea in India
(v) Name the type of vegetation in which the following kind of trees are common Sal, Shishem and Teak
(vi) What type of rainfall occurs in northern India during winter season

(vii) Why South India is more favourable for the growth of coffee than Eastern India.

(viii) Which of the following resource is a major power resource?

Manganese, iron ore, uranium, natural gas.

(ix) Give two reasons why is biosphere called a unique feature of the earth?

(x) Which method would be best to depict the seasonal amount and pattern of rainfall of a village bar or line graph

3. (i) What were the major purposes for which Damodar Valley was planned? Give one reason why it has become a major industrial belt.

(ii) Identify the similiarity and differences in the methods and organisation of farming of the corn belt in U.S.A and the collective farm of the Ukraine region of U S.S R

(iii) If lumbering is to be developed in tropical regions similar to that of temperate regions suggest what methods can be adopted

4. (i) Describe physical feature and drainage of peninsular India

(ii) What are the means of irrigation practised in India? Which one of them is followed in north western part of this country and what is the source of water supply there?

(iii) Give reason why the iron and steel industries in Bihar and West Bengal use coal and thermal power but those in South India use firewood and hydel power

5. (i) What is the difference between weathering and erosion Illustrate with examples.

(ii) Explain any four important factors which are responsible for the development of mining industry in Damodar Valley

6 Give reasons why

India used to export mostly raw materials and unprocessed goods and imports processed and finished goods.

What impact did this have on the economy of our country.

Expected Outline Answer

			Marks to each point	Total marks
1.	(ix) a.			
		Show distance of 3500 metres	1	
		Draws the rectangle to scale	1	2
2	(i)	North-Ngaraland	½	
		South-Condwanaland	½	1
	(ii)	Arid areas of Rajasthan and Gujarat	½+½	1
	(iii)	60°C-75°C Temperature	½	
		100 cms—150 cms rainfall	½	1
	(iv)	Hilly and upland slopes	1	1
	(v)	Tropical deciduous (Monsoon-Type)	1	1
	(vi)	Cyclonic	1	1
	(vii)	Soils-Gondwana rock rich in iron and lime content	1	1
	(viii)	Natural gas	1	1
	(ix)	Water and living organisms are present	1	1
	(x)	Bar graph	1	1

		Marks to each point	Total marks
3.	(i) The Damodar Valley project was planned so as to	½ mark each	
	1) control floods 2) reduce erosion 3) provide irrigation 4) generate electricity 5) provide navigation facilities		
	Industries have developed in this area due to proximity of raw materials	2½	
	iron ore manganese, limestone, coal and the water supply	1½	4
	(ii) The similarity in the Ukraine collective farm and the corn halt in USA regarding the method and organisation of farming are (i) large farms (ii) commercial organisation (iii) animal husbandary and crop cultivation done together		1½

Differences	USA	Ukraine		
i. Size of farm	1000 hectares	6000 hectares		
ii. Ownership	Individual	workers	2½	4
iii. Income	Sales as-income	wages to workers		

4.	1	Decrease the variety to only one type so that large quantities of the same wood is available.	1

			Marks to each Point	Total Marks
	2	Industrial conversion of raw material in the plantation area itself	1	
	3	Energy be produced from the rivers for cutting processing instead of manual effort	½	
	4	Utilizing local transport facilities, like animals more effeciently to reduce cost by fuel increase	3	
		Central table land is trianguler in shape is at an average height of 300 metres In the NW portion are crystalline the laws flows or the Deccan trap North of the table and the rift valleys of Narmada and Tapti	2	
		The plateau tilts eastwards and in the north east are the old mountains which form the Malwa plateau. Drainage Except Narmada-Tapti which flows west wards all others flow eastwards and in the deltas 4 district river basins of Peninsular rivers	2	4
(ii)		Means of irrigation in India canal, tanks, wells and tube-wells	2	
		Canal irrigation system Source of water are the rivers like Sutlej and of Himalayan rivers	2	4
(iii)		Coal is produced in abundance along with thermal power in the neighbouring areas of NE India	2	
		In south India coal bearing areas are distant and less coal can be produced The deciduous forests of Karnataka provide cheap and abundant fire wood Facilities of hydel power due to the Peninsular rivers	2	4

Marks to each Point | Total Marks

5 (i) Weathering is the process by which
the rocks exposed on the surface get
broken up due to exposure to
temperature humidity and precipitation 2
Examples Rocks, soil formation
Erosion is process which gradually wears
down the land and carries away the
eroded material and deposits them in
new areas 2 4
Examples wind, water, glaciers, underground
water

5 (ii) i) Many mining centres located
has with (egs) (Raniganj, West Bengal)
ii) Availability of HEP to carry
on mining (Project a Thermal
Power)
iii) Proper utilisation as other factors
are favourable for location of
Industries Iron of Coal in close proximity
iv) Transport facilities available, cheap
labour of population

6. i) In the period before Independence the export
of raw materials was high. After Independence
the payment for the imported finished goods is
possible only when high priced raw materials
are exported. 2
i) Non-traditional items engineering goods
and machinery have now entered the export
market raw materials like manganese still are
high on the export list. 2
iii) The effect has been the high price of raw
material in India, absence of large processing
units and dependence on imports for meeting
needs of heavy industry 2 6

Chapter VI

Geography Theory **Class XII**

Max. Marks : 70

I.	*Weightage to objectives*	*Marks*	*Percentage*
	Knowledge	20	28.6
	Understanding	25	35.8
	Application	15	21.2
	Skill	10	14.4
	TOTAL	70	100.00

II.	*Weightage to Content*		
1.	Major resources of the earth classification, world distribution of major resources and conservation		12
2.	Use of Natural Resources		18
	1 Primary activity		
	2. Secondary activity		
	3. Tertiary activity		
3	Population, and settlement		10
	i Population		
	ii. Rural Settlement		
	iii. Urban Settlement		
4.	Profile of work force		6
5.	Economic Resources		
	i. Resource Base	5	14
	ii. Agriculture		
	iii Industry	5	
	iv Transport	4	
6	Regional Dimensions of Economic Development		
	i. Planning concepts of territorial division of labour, Prodution cycle territorial production cycle, multilevel Planning	3	10
	ii. Case Studies	7	
			70

III	*Weightage to forms of Questions :*	*No. of questions*	*Marks*	*Minutes*
	Very short answer	18x1	18	30
	Short answer	7x4	28	50
	Essay Type	3x8	24	100
		28	70	180

Blue Print

Human and Economic Geography

UNIT
Maximum Marks . 70

Class X
Time 3 hrs

Sl. No.	Objective Content Unit Form of Question	Knowledge				Understanding				Application			Skill		Total
		E	SA	VSA	O	E	SA	VSA	O	E	SA	VSA	E	SA	
1	Major resources	8(1)						1(1)				1(1)		2(2)	12(5)
2	Use of Resources Agriculture					8(1)		2(2)			4(1)	2(2)		2(2)	18(8)
3.	Population of Settlement			8(2)				1(1)						1(1)	10(4)
4.	Profile of WF of India						4(1)	1(1)						1(1)	6(3)
5.	Economic Resources of India						4(1)			8(1)				2(2)	14(4)
6.	Regional Dimensions in India			4(1)			4(1)							2(2)	10(4)
	SUB.TOTAL	8(1)		12(3)		8(1)	12(3)	5(5)		8(1)	4(1)	3(1)		10(10)	
	TOTAL			20(4)				25(9)				15(5)		10(10)	70

Notes · Figures within brackets indicate the number of questions and figures outside the brackets indicate marks.
*Denotes that marks have been combined to form one question.

Summary ·				
Essay (E)	No 3	Marks 24	*Scheme of Options*	NIL
Short Asnwer(SA)	No. 7	Marks 28	*Scheme of Section .*	NIL
Very short Answer(VSA)	No. 18	Marks 28		
Objective(O)	No. 18	Marks 70		

Geography Theory

Time allowed 3 hrs *Class* . XII
Max Marks · 70

Instructions

I All questions are compulsory
II. Attach maps required for question no. 1 securely inside the answer book
III Marks are indicated against each question
IV. Answer all the parts of a question in the same order as given in the question paper

1 Locate and label the following in the supplied outline map of the world
  i Lake Michigan and lake Erie manufacturing areas of North Amercia
  ii Maracaibo fields in Venezuela
  iii Panama Canal
  iv Ural iron + steel producing areas of USSR
  v. Rio de Janeiro Port city (5)
2. Locate and label the following in the supplied outline map of India·
  i. Area with a higher female sex ratio in Orissa
  ii. Area of dry farming
  iii. One port which has a face trade zone in Gujarat
  iv. Two coal fields of Damodar river basin (5)
3. Answer the following questions in not more that one word or sentence.
  i Which of the following is a piotic resource (Manganese, gold, rubber, water, iron, fishes, animals)
  ii Name the process by which raw material is converted into finished goods
  iii Give the main characteristic of sedentary farming
  iv What is the inner most zone of a city in the concentric zone Model of E W Burgess called
  v. State the factor other than natural increase which contributes to population growth of a town
  vi. Which are the two countries listed here in which rubber is not grown (Kenya, Brazil, Zaire, Peru, Nigeria)
  vii What is the main difference in the commercial use of the temperate and tropical forests
  viii Which factor of location is common to fertilizer and aluminium factories.1 mark each 4 What are the major characteristics of functional and homogenous regions 4
5 i Explain why north west Europe is amongst the most densely populated areas to the world 4
  ii Give the natural condition of the area in which the Bushmen of the Kalahari live 4 8

6 i Compare the major characteristics of compact and dispersed rural settlements
ii Explain, by giving examples from the Bastar region the economic problems of a tribal region

7. i How is the workforce identified? State the major characteristics of size and occupational structure of the workforce in India 4
ii Illustrate with examples from Tamilnadu and Punjab the main features and impact of the Green Revolution 4 8

8. Identifiy the characteristics and nature of adaptation of each major forest type in the world in respect of its location and climatic conditions 8

9 Identify the factors that have made rice an important crop in the world Rice cultivation areas are limited in their extent Elaborate with illustration. 8

10 Analyse the characteristics of any two majo industrial regions in India with respect to (i) raw material (ii) labour (iii) power and market 8

Marking Scheme

1, 2 The location are given on the outline map attached. Each correctly located and labelled answers alone should be given 1 mark Partial answers of correct locations and no label are to be awarded only ½ mark.

S No		Expected Answer	Marks to each	Total marks
3 (i)		rubber, animals	1 mark each	
(ii)		manufacturing		
(iii)		farming done at a single location year after year.		
(iv)		Central Business District (CBD)		
(v)		migration		
(vi)		Kenya Piru		
(vii)		temperate lumbering tropical collection		
(viii)		Power supply		
4.	Functional regions	i. Unity of organisation interdependence between its parts	1	
		ii. the unifying force is one of movement between parts i e the way the aspects are related to one another	1	
	Homogeneous regions	i similarity in the character or nature of characteristics	1	
		ii uniqueness of the similarity and its presence every where within the area	1	(4)
5 (i)		The reasons for dense population of NW Europe The mechanization of agriculture required the consolidation of small farms into large holdings.	1	
1.		Spread of industrialization, need for more labour in factories and trade, concentration of population	1	
2.		Out migration from rural areas of population who were landless to industrial centres in the last century	1	
3		The mechanization of agriculture required the consolidation of small farms into large holdings	1	

4. Spread of industrialization and the reduction of agricultural areas Decrease in size of farms and increase in yield per man due to mechanisation 1 (4)

5. (ii) The natural conditions in which the bushmen of the Kalahari live are

1 Scanty Veg with horny scrubs. *Extent 362,600 sq Kms* of desert area occupying the whole of the north east of the country in the tropical belt 1

2 30 cms of annual rainfall and cool winters with very hot summers when rainy season occurs. 1
In summer temperature are (46°C) in the day and (10° C) at night 1 (4)

6 (i) Major characteristics of settlements

Compact		Dispersed	
Number of households Density from 6-7 huts to 100-5000 population depending on the land resources	1) 2)	single homestead or a smaller village group of houses away from a larger village	
(from 1-) many houses close together forming the main village small Caves		Usually occur in areas of sparse population	1½
ii Distribution nucleated in cleared areas along fertile tracts		scattered in the centre of large farmsteads, along hill sides no nuclear	1½
iii Layout Older areas in the centre new households on the fringe		single households with store houses and sheds for animals and tools	1

6. (ii) The economic problems of tribals from the case of the tribal development block Baster are

1. remoteness, inaccessibility and as as a result the tribes in interior areas are very primitive — 1 mark for any four points
2. poor development of transport due to hilly terrain and number of rivulets.
3 isolation of one tribal group from the other

4. shifting cultivation, poor thin soils, erosions
have retarded development of agriculture as done
by the tribal people

5 gathering and attracts the main economy in forest
areas which does not yield high returns (4)

7. (i) Workforce is the proportion of people in the
age group 15-50 years who are engaged in economic
activities to yearn a living measurable as
income money or wealth 1

1 Characteristics of the Indian workforce
Out of a total population of 658.14 m in 1981
174 11 m i.e 33 44% are identified as workers.
14 44% females and 51 23% male workers
to total population 1½

2 What is the proportion of M+F in 17 411 m workers
Occupational structure over the last 10 years
not more than 33.3% of total workers are
engaged in agricultural activities in 1981. Many of
the younger age group of workers 15-29 years
are unemployed 1½ (4)

(ii) The main features of the Green Revolution in India

1 The use of hybrid seeds to increase the yield per hectare-
example in Pubjab yields of wheat were
double that of all India. 1

2 nearly 85% of the area under wheat was under
controlled irrigation increasing the yield
per hectare in Ludhiana for example from 1336 in
160-61 to 3310 in 1971-72 1

3. G R. means area of wheat increased. Its field
area increased. Increase of irrigation use of
mechanisation it measures and by bright values of needs
Bringing in new land under cultivation multiple
cropping. 1

4. The benefits of the agriculture improvement programmes
were more beneficial for areas with irrigation than
for those irrigated by rain like their drier
areas of Tamil Nadu, Central India etc 1 (4)

8 Major forest types and their natural conditions are

(i) *Tropical Rain forests:*

Location : Equatorial areas in each South
Continent America - Amazon Africa - Zaire,
Congo basin Asia· South East
and India 1

	Climate ·	High temperatures (40 C) and rainfall (200 Cms) Monsoon areas drier in summer	½	
	Effect Vegetation .	Tall trees growing to different heights, thick large leaves and luxuriant growth, variety of trees, climbers in equatorial rain forests	1½	
		Monsoon forests less luxuriant with thick undergrowth of shrubs and small trees		(3)
(ii)	*Temperate Deciduous Forests*			
	Location	North and South of the equatorial rainforests in the 20° - 40° Latitudes		
	Areas	north China, Japan, West South and Central Europe, Eastern North America, SW & SE Australia and Tasmania, Mediterranean region, Western South America		
	Climate ·	Both oceanic and continental areas July temperature 25°C and January — 3°C Summer rain of 50 cms to 100 cms Winter rain occurs of small quantities	1½	
	Effect on	Both conifers and broad leaved forests occur Conifers in the north and brodleaved in the humid sub tropical and temperate midlatitudes	1½	
(iii)	*Coniferous Forests*			
	Location .	50°N—70°N and altitudes of more than 1520 metres to 2100 metres		
	Area . (Attempt to name on each continent)	Western, Central and Eastern North America, northern Europe, Asian USSR, Southern Chile, Brazilian Plateau, New Zealand, South Africa Alps and Himalayas	1	
	Climate	Low temperature of 10° C to 20° C and a short cool summer and average precipitation is about 20–30 cms annually	1	
	Effect on Vegetation	The long cold winters with short Summer is ideal for the growth of confirs	½ (2½)	(8)
9	Rice is a major crop because it			
1	can be grown in tropical and monsoon lands where swampy deltas, flood plains and irrigation low lands are extensively found . .		½	

		Marks	
2	Cultivated for a long time by civilizations in areas where population concentrations are high because rice growing is labour intensive .	½	
3	intensive use of land is necessary and this is ideal where there is less cultivable land.	½	
4	Up to three crops can be cultivated because of irrigation and rainfall throughout the year. (Rice and Wheat can be grown in the same areas) (Through water requirements are differnt)	½	(2)

Delimilation of areas of rice production

(a)	Japan :	Kyushu, Shikoku and Southern Honshu		
(b)	India : Bangla-Desh	Delta regions of S India of Coastal regions and in the Punjab and Haryana hilly areas of U P Kashmir, Nepal	½	mark for each country
(c)	China .	South in the Yangtse and Sikiang south East coast and Szechwan Bozin	0	
(d)	South : East Asia	Deltas of the Redriver Mekong, Irrawaddy, Kedah Java, Coastal Sumatra, Central Borneo and Phillipines		
(e)	Nile valley Southern USA delta and	and deltas, South East Brazil and North Italian Plain, Rhone Ebro Basin of Spain	(3)	

(Any three areas from a-e)

(Full marks are to given for naming at least of the areas in each continent

Reasons for the cultivation of these crops in these areas

i.	The areas where rainfall is over 100 cms and the temperatures are between 22- 35 C annually with a long season of at least 3 months followed by a dry season	1
ii	Deltaic soils which are capable of retaining water and availability of irrigation are essential for rice cultivation which is available only in river basins	1

iii) Upland hilly areas where there is a short summer are also suitable for rice cultivation 1

(Marks are to be given for giving reasons in terms of natural conditions not economic- l abour, mechanization etc.)

2+3+3 (8)

10. The characteristics of major industrial areas of India with reference to the form factors of localization of industries—Raw materials, Labour. Power and market

a) Chotanagpur Plateau industrial region

The raw material base of coal hydel power in the Damodar valley, Ironoar in the Bihar, Orissa mineral belt, has made this region into a major mining and iron and steel producing area. The availability of iron and steel has enabled the manufacturing of engineering goods in the port areas of Calcutta and Paradip Labour and Market are linked through railway and road from the neighbouring areas of West Bengal, Bihar and Orissa.

Raw-
material
2

b) Bombay-PUne Region.

Market location of a port with the advantage of transport link through railways and Round to the rest of India has contributed to the development in this area of cotton taxtile industries

Anciallary industries like oil refineries light engineering goods and con sumer goods have is mainly from petroleum thermal and hydel sources generated elsewhere in the State

3

c) Ahmed ab ad-Baroda region.

Based on the raw material of cotton and influen ced by the anture of textile development in the Bombay Pune region which had Become over crowded

The raw material of petroleum and proximity to West Asi a from where petroleum is imported have generated refining & fetilizer industry in this area.

As yet market and link to it are mainly throngh Bombay

3

d) Madurai-Coimbatore-Bangalore region·

Availibility of cheap power from hudet and fire wood, labour and proximity to the.port of Madras has contributed most to the devslopment of this region.

Traditional cotton textile industry in the Coimbatore-Madurairegion and public sector undertakings of HMT, HQL and III have helped Bangalore devalop industrial ectivity

Full marks are to be awarded only

If the dislt inctive causes of the development are stated

ii Points of analysis are stated as Raw material-power-labour and market for each region.

State the names of major land regions of India (2 marks).

In term of Raw Material Labour and market and two region is to be explained 3 marks for each region

Question-wise Analysis

Sl No		Objective	Content Unit	Form of Questions	Marks Allotted	Estimated difficulty Level
1	a.i.	Skill	Industrial area (Major Resources)	VSA	1	B
	ii.	-do-	Major Resources	VSA	1	B
	iii.	-do-	Use of natural resources	VSA	1	B
	iv	-do-	Use of natural resources	VSA	1	B
	v	-do-	Population & Settlements	VSA	1	B
2	b i	skill	Profile of the Work-force	VSA	1	B
	ii	-do-	Economic Resources	VSA	1	B
	iii	-do-	Agriculture, Economic resources	VSA	1	C
	iv	-do-	Minerals observation	VSA	1	C
	v.	-do-	Population Regional-dimension	VSA	1	B
3	i	Understanding	Major of Resources	VSA	1	B
	ii	-do-	Manufacturing use of Natural resources	VSA	1	C
	iii	-do-	Types of Agriculture	VSA	1	A
	iv	-do-	Structure of Cities-population and settlement	VSA	1	B
	v	-do-	Profile of work force in India	VSA	1	B
	vi	Application	Major Resources	VSA	1	B
	vii.	-do-	Use of Natural resources	VSA	1	B
	viii	-do-	Resources -do-	VSA	1	B
4		Knowledge	India—Regional dimension	SA	4	B
5	i	Understanding	Population and settlement	SA	4	C
	ii	Knowledge	World-population & settlement	SA	4	C
6	i	Understanding	India—Rural settlements	SA	4	B
	ii	-do-	India-area Development	SA	4	A
7	i	Knowledge	India-Work Force	SA	4	B
	ii	Application	Major Natural Resources Agriculture	SA	4	B
8		Knowledge	World Major Resources	E	8	B
9		Understanding	Use of major resources	E	8	B
10		Application	India-economic Resources	E	8	A

O for Objective Type
VSA Very Short Answer Type
SA Short Answer Type
E Essay Type

+A Difficulty
B Average
C Easy

Blue Print

Subject Geography **Economic and Special reference in India** *Class* · XII
Maximum Marks . 100

S No	Form of Question / Content Units	Knowledge E	Knowledge SA	Knowledge VSA	Knowledge O	Understanding E	Understanding SA	Understanding VSA	Understanding O	Application E	Application SA	Application VSA	Application O	Skill E	Skill VSA	total
1	Natural Regions						5(1)						2(2)		1(1)	8
2	Population				4(4)		5(1)				5(1)				3(3)	17
3	Settlements		5(1)*						5(5)				3(3)*		2(—)*	15
4	Natural Resources		2(1)*				5(1)								2(—)*	10
5	Agriculture				3(3)		5(1)		1(1)		5(1)				2(1)	16
6	Energy				1(1)				3(3)		5(1)				1(1)	10
7.	Industries				4(4)				3(3)		5(1)		2(2)		2(2)	16
8	Trade Transport				2(2)		5(1)								1(1)	8
	SUB TOTAL	7(2)		14(4)		25(5)		12(2)		20(4)		7(7)			15(9)	100
	Total	21(6)				37(7)				27(11)					15(9)	100

Notes Figures within brackets indicate the number of questions and figures outside the brackets indicate marks
* Denotes that marks have been combined to form one question

Summary		
Essay (E)	No ______	Marks ______
Short Answer (SA)	No ___11___	Marks ___55___
Very Short Answer (VSA)	No ______	Marks ___12___
Objective (O)	No. ___33___	Marks ___33___
	44	100

Scheme of Options NIL
Scheme of Sections . 2 A NCI
B SA/ET

Sample question paper

Geography . Economic and Special reference to India

Class XII *Time* 3 hrs

General Instructions

1. All questions are compulsory
2. Answers to question nos 1 to 33 are to be given in the space provided on the answer sheet itself and returned in 30 minutes
3. Answers to question nos. 34 to 44 carry 5 marks and should not exceed 50-100 words
4. The map questions no 45 (i-ix) are to be attempted on the maps provided and attached to answer sheets.

Objective type test on Economic Geography
SECTION - A

Class . XII *Time* 30 minutes

Instructions

1 All questions are compulsory
2 Correct answer is to be written in the space provided

1 Which of the following branches of Geography deal with the study of population
  i Ecology ii. Economic Geography iii Demography
  A If i and ii are correct
  B If ii and iii are correct
  C If i and iii are correct
  D. If i, ii and iii are correct ( )

2 Which of the following describe the term optimum population
  A. Production increases and population decreases
  B Population increases and production decreases
  C. Production remains same and population increases
  D Population and production remains constant ( )

3 Why are the Monsoon lands thickly populated?
  A Yield per hectare is high
  B Flat land and fertile soil
  C. Favourabe climatic conditions
  D Higher percentage of irrigation ( )

4 Which of the given reasons explains best why India had low growth rate of population in the early parts of this Century?
  A High death rate
  B. Low birth rate
  C High birth and death rate
  D High birth rate and low death rate ( )

5. Which one of the following types of Agriculture is practised in Central Africa?
A Commercial
B Intensive
C. Subsistence
D Plantation ( )

6 Which country ranks top in the production of Rubber in the world?
A Indonesia
B. Malaysia
C Singapore
D Burma ( )

7 Which one of the following states is the largest producer of sugar cane in India?
A Karnataka
B Maharashtra
C Bihar
D. Uttar Pradesh ( )

8 Mineral oil is found in association with
A Water and natural gas
B Sedimentary rock and limestone
C Coal and natural gas
D Shale and limestone ( )

9 Whick one of the following groups of industries best explains the classification of industries on three-fold ownership basis, Public, Private and Joint Sector in India?
A Iron & Steel, Air-Craft, Woolen-textiles
B Cotton textiles, Cement, Paper
C Rolling stock, Fertilizers, Electronic equipments
D Major defence equipment, Heavy engineering, Super Thermal Power plant ( )

10. Which one of the following factors best explains the location of aluminium, zinc, lead, smelter plants along 'fall line' in foothills in the stem of Appalachains in USA?
A Raw material is available there
B Metals extraction consumes hydel power
C Market is accessible there
D. Area is well linked by means of transporation ( )

11. Which one of the following towns has coal based thermal as well as fertilizer plants?
A Sindri
B. Neyveli
C. Trombay
D Singrauli ( )

12. Which one of the following statements is *not* correct?
A. Heavy Engineering Corporation lies at Ranchi
B 'Garden Reach' workshop (ship-building) at Calcutta
C. Integral Coach factory at Bangalore
D BHEL plant is located at Bhopal. ( )

13 Which one of the following types of transport is found in Bangla Desh?
A Railways due to plain area
B Roads in plateau areas
C Ropeways due to hilly area
D Waterways due to more navigable rivers ( )

14 Which of the following items has the highest export from the Southern Hemisphere countries?
A Processed agrobased goods
B Manufactured goods
C. Raw materials
D Machinery spare parts ( )

15 The growth of urban centres in India during the last twenty-five years has been chiefly due to
A creation of new capitals
B rapid industrialization
C migration from rural areas
D spread of transport facilities ( )

16. A very large percentage of the population in India lives in villages chiefly due to
A slow growth of industries
B subsistence type of farming
C high cost of living in cities
D lack of jobs in cities ( )

17 Which one of the following is a major problem created by the rapid growth of urban centres?
A Sanitation and sewerage
B political water supply
C Non-availability of building material
D Pollution of the atmosphere ( )

18 New Delhi owes its growth to its
A historical importance
B tourist attraction
C Political importance
D position as a route centre ( )

19 For which one of the given reasons is Calcutta the largest city of India
A large number of tertiary functions
B the administrative centre during the British rule
C access to vast hinterland with diverse products
D most important port on the east coast ( )

20 The increasing area and output in agriculture in recent years in the world is mainly due to
A Increase in the use of fertilizers
B. Use of various methods of irrigation
C Improved agricultural techniques
D More returns from the agricultural activity ( )

21 Which of the given justifies why man should harness nuclear energy for peaceful purpose?
A to make development process rapid
B. as a weapon of destruction it could wipe out the whole mankind
C can save irreplaceable sources
D cheaper to use as an alternate source of energy ( )

22 Which of the given reasons explains why dependence on thermal sources for energy will not reduce in spite of the development of alternate (wind. tidal water) sources of energy.
A thermal sources are ubiquitous
B alternate sources are more expensive
C coal and mineral oil produce maximum energy
D alternate sources are area specify ( )

23 Which one of the given conditions determine the production of hydel power at the least cost
A precipitation through out the year
B large reservoirs to regulate water
C dams across courses
D topography and constant water supply ( )

24 Which one of the follwing factors gives an alvantage to Demark over Argentina for the development of dairy farming industries?
A rich grasslands
B scarcity of land for agriculture
C highly developed breeds of cattle
D vast international market ( )

25 The Sugar industry in India has in recent years shown the trend of migrating to the South of tropic of cancer and this is largely because there are large areas covered by moisture retentive black soils
A T T (Yes) Both statements true and correctly related
B T T (No) Both statements true but not correctly related
C T F First statement true the Second false
D F F Both statements false

26 Considering the availability of resources and achievements in chemical science, which one of the following sides would be best suited for establishing a petro-chemicals complex?
A Delhi
B Ranchi
C Baroda
D Kandla

27 Thar Region has theory scrup type of vegetation because intensive erosion that has occured due to sporadic heavy rainfall
A. T T (Yes) (Both statements true and correctly related)
B T T (No) (Both Statements true but not correctly related)
C T F (First statement true the Second false)
D F F (Both statements false)

28 Mt Regions of Assam have wet tropical monsoon forests because they have
A high rainfall with summer maximum

B Location in the track of S W Monsoon
C More rainfall due to high altitude
D High humidity and low elevation

29 Of the given explanations which one can be accepted to describe the process of city growth from the 18th to 20th Century in India

1 Indistrial development and the growth of industrial centres
2 Emphasis on trade and the development of port and harbour location with productive hinterlands
3 Colonial powers who expanded their control and developed administrative centres and forts as cities

A if 1, 2, 3
B if 2 and 3
C. if 1 and 3
D. if 1 and 2

30. In which area could farming be done on a large scale?

A Coromandel coastal plain
B Narmada Valley
C. Brahamputra Valley
D Indo Gangetic plain

31 Many labour intensive industries producing consumer goods have tended to shift from highly developed countries to developing countries like Singapore, Hongkong etc.
because
There is a larger local market in these countries

A if T T (Yes)
B if T T (No)
C if T F
D if F T

32 In which one of the following industries in India is the availability of raw material in the neighbourhood *not* a primary consideration?

A Iron and Steel
B Cement
C Paper
D Ship-building

33. Considering the availability of natural resources for the purpose which of the following industries can best be attempted in Indonesia?

A Rubber goods
B Cotton Textile
C Cement
D Iron and Steel

Economic Geography (Special reference to India)

SECTION-B

Class · XII *Time* . 2½ Hours

1 All questions are compulsory
2. Marks carried by questions No 34-44 are 5 each
3 For question No 45 sections six maps should be filled up and attached to answer books

34 What type of rural settlements are found in coastal plain of Kerala and Himachal Pradesh?
(i) For eacc type of settlement give one physical and one economic factor responsible for its pattern
(ii) Draw diagrams showing physiographic conditions which result in such patterns for each type

35 (a) Name one product each derived from these resources
- A Air
- B Water
- C Soil
- D Forest

36 Give two similar characteristics of rainfall and two dissimilar characteristics of Temperature in Tropical and region and cold arid regions.

37 Explain how the given factors contribute to uneven spread of population? Select examples from the Ganga plain to illustrate the answer

Factors
- (i) Availability of agricultural resources, minerals etc
- (ii) Availability of water by rainfall
- (iii) Accessibility

38 Give at least two reasons why more emphasis is being given to develop hydel power in India at modern times Give three problems which retard the development of hydel resources

39 Give three main distinguishing features between intensive agriculture and extensive Agriculture?

40 (a) Show the main two international trade channels on the world map.
(b) What would be the effects on the economy and International trade of the western Europian countries if they are not allowed to use

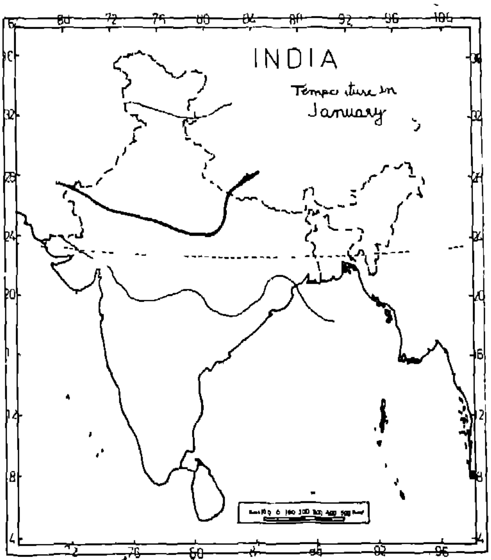
41. Below are two statements regarding the relation between population and economic development. Choose any one position and suggest two reasons why you agree with it
- (1) The quality (i e. age, sex, ability) of the population of a country is more important than size of the population.
- (2) The quality (i e Education, health facilities, employment, female participation) in a economy control the population size.

42 Suggest one remedial measure for each of the following problems facing Indian Agriculture?
- (1) Low productivity/age
- (2) Gambling with Monsoon
- (3) Lack of financial facility
- (4) Lack of better marketing facility
- (5) Less knowledge about scientific agriculture

43 Developed countries have exhausted their natural resources of coal and oil due to long exploitation

1 Explain why they are facing shortage?
2 Why is the price of mineral oil and coal very high?
3 Identify the 2 advantages and 2 disadvantages of inexhaustible sources over the power resources of exhaustible type

44 Explain by giving any two illustrations of Indian Exports to show how the development of industries had enabled the reduction of import of finished goods and increase the use of available raw-materials.



The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line

45 (i) On the given map of India locate the resources of Manganese. Mica and Petroleum shown

(ii) On the given map of India and locate the resources of Manganese, Mica and Petroleum resources

(iii) For any one given Continent in the southern Hemisphere, show the distribution of population

(iv) Draw a graph of world population growth on the basis of table given below

Years	*Population* [*in Millions*]
1650	545
1750	728.4
1850	111
1960	2774.9
1975	3794

(v) Draw Bar graph to show the population of the different nations in 1975 using the following figures.

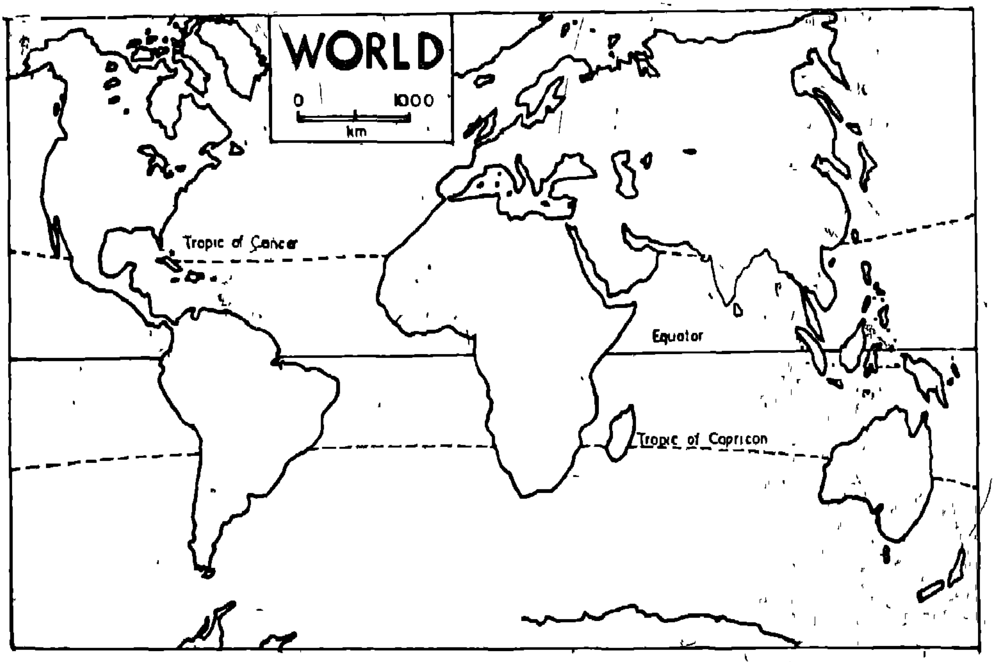
Continents	*Population [in Millions]*
Asia	2185
Africa	375
Australia	34
Cental and South Americas	303

(vi) Draw a Bar diagram by using the given data?

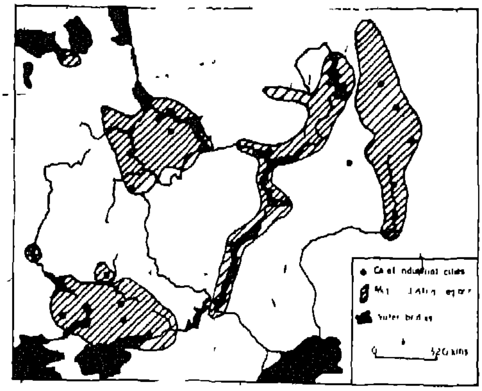
Coffee Production India (1979)

State	*Production in tonnes*
Karnataka	83,405
Kerala	19,675
Tamil Nadu	6,970
Others	2,000

(vii) Locate on the map of the world the mineral oil producing areas from the middle east and SE Asian countries



The territorial waters of India extended into the sea to a distance of twelve nautical miles measured from the appropriate base line



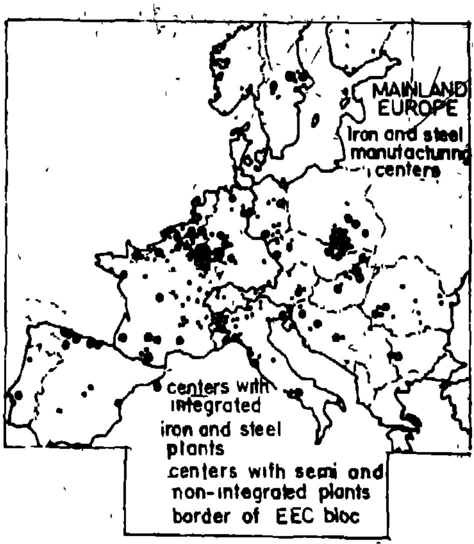
(viii) On the map showing the industrial regions of USSR— label the following

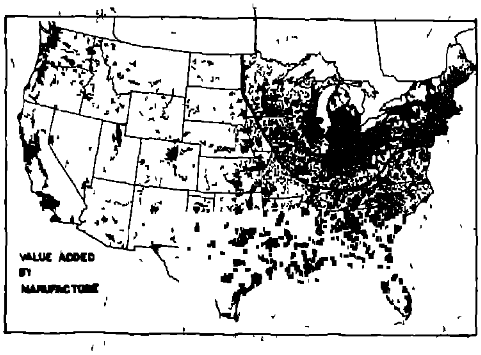
(a) Write the name of industrial region based on Krivey Rog Iron ore and Donetz coal fields.

(b) Locate in the oldest [illegible] USSR particularly famous for textiles, chemicals, paper and [illegible]

(c) Name the industrial [illegible] Russia developed mainly after second world war.

(d) Mark and name the most famous Iron and Steel centre in Ural Region.


MAINLAND EUROPE
Iron and steel manufacturing centers
centers with integrated iron and steel plants
centers with semi and non-integrated plants
border of EEC bloc



(ix) Maps showing industrial regions of Europe and U.S.A. are given:

(i) In NE USA identify a nucleated industrial region. Name two towns between which it extends

(ii) Of the following three industrial regions, label the one which is mainly based on Coal fields, also label the others on the map

(a) London
(b) Ruhr
(c) Paris

Marking Scheme and Scoring Key

Q No	Answer	Marks Allotted
1.	C	1
2	D	1
3	B	1
4	A	1
5.	C	1
6	B	1
7	D	1
8	A	1
9	A	1
10	B	1
11	B	1
12	C	1
13	D	1
14	C	1
15	B	1
16	B	1
17	D	1
18	D	1
19	C	1
20	B	1
21.	A	1
22	C	1
23.	D	1
24	B	1
25	B	1
26	C	1
27	B	1
28	C	1
29	C	1
30	D	1
31	C	1
32	D	1
33	A	1

34(a)	(i) Linear	½
	(ii) Dispersed	½
	(i) Long narrow coastal plain backed by Wh Ghats high density of population so continuous settlements	1

	(ii) hilly nature of the land, not enough flat land available/ inaccessibility low density of population/ large area required to support each family	1	5
35(a)	1. Wind mill	½	
	2. Hydel power any other relevant example	½	
	3. Agriculture	½	
	4 Woods/paper	½	3
36.	*Similar*		
	i Tropical and Regions and cold and Regions have scanty Rainfall	1½	
	ii Main precipitation in Summer	½	
	Dissimilar		
	i. Cold and regions have diurnal range of temp 15-20°C and in Tropical arid Regions 30-40°C	1	
	ii Annual range of temperature in tropical and region is 10°C but in cold arid regions is about 40°C	1	5
37	i. Ganga plains being alluvial plain built by deposition of alluvial soils encourages agriculture	2	
	ii Example Uttar Pradesh, Bihar and W Bengal and further the general topography of plain gives ample chances for the development and constriction of canals, road and laying out of railway tracks The confluence of water from different rivers provide chances to estabilish agro-based industries	2	
	iii In addition these plains receive adequate rainfall from SW monsoon Because this these plains are very thickly populated	1	5
38	Reasons for more emphasis		
	1 Coal and petroleum will exhaust at a time	1	
	2. Water power is inexhaustible and cost is low Causes of retardation	1	
	1 It requires more capital	1	
	2. Cannot transported long distance	1	
	due to hilly areas being inaccessible	1	

	3 Seasonal fluctuation of Indian river	1	5
39.	1 Intensive Agriculure in practised largely in densely populated areas	1	
	Extensive Agriculture is practised mostly in cultivable land with spare population	1	
	2. Intensive Agriculture used advanced techniques	1	
	Extensive Agriculture used highly mechanised	1	
	3. Intensive Agriculture has more yield/acre	½	1 mark for any 1 of 5 these
	Extensive Agriculture has more yield/man	½	
	4. Intensive Agriculture—more variety of crop	½ point	
	Extensive Agriculture—usually single crop	½	
40	1 At present West European Countries are getting food and raw materials from the countries which are on the west coast of Latin America	1	
	2. Being highly industrial countries they are in need of raw materials	1	
	3 If they are not allowed to use Panama canal they have to travel round the continent of South America	1	
	4. Result is that route will increase 6000 km		
	5 Ultimately it will consume more time, money and energy The prices of raw material will be high finished goods will be also high—then it will difficult to compete in the open market of the world	1	
	6 Map-correctly filled up	½	1
	labelling correctly	½	6
41.	1 Choice of either of the statements is to be considered		
	2. For other statement the reasons should indicate		
	(i) link between population size and level of development	1½	

	(ii) Resource availability and population size	1½	
	(iii) Illustrations from either a developed or developing country to support position	1	5
	I *If first statement is selected*		
	(i) The size of the country's population is of more economic importance—which the factor of production depends very much upon employment, availability of quality of human labour, age composition of the population. The survival of the country depends on the quality of the people	1½	
	(ii) People are consumers as well as producers—in developed countries with more people, varied products can be obtained whereas to feed too many people in under-developed countries poses more problems	1½	
	(iii) Examples are India, Bangla Desh and SE Asia which have to develop their quality of population than the quality of the population, organisation and relevance	1	5
	II *If second statement is selected*		
	(i) In large size of population, these qualities are limited because the more concentration is being paid on primary activities	1½	
	(ii) The cultural and technological skills of the people, education level, health conditions and standard of living contribute to the resourcefulness of a human society. People engaged in secondary and tertiary activities are increased	1½	
	(iii) Illustrations—Developed Countries enjoy high standard of living by implementing the above qualities (as indicated in the statement) for eg —West Asia, China, and some of the West Eruopean and African countries	1	
	3 Organisation and relevance	1	5
42	1 Use of better seeds, more fertilizers	1	
	2. Increase in irrigated area	1	
	3. Providing easy financial credits through banking, Co-operatives, Govt Subsidiary	1	

4. Providing nearby markets, avoiding middleman, providing warehouse facilities 1

5. Educating the farmers in Scientific Agriculture 1

43. (i) Developed countries have exhausted their natural resources of coal and oil due to long exploitation ½

(ii) high cost of getting mineral oil and coal through imports ½

(Choice of any two of the following)

Advantages		*Limitations*	
Tidal	inexhaustibility	to coastal areas	4 for 2 choices with 1 mark for each advantage and disadvantage
Wind	saves long distance transmission		
Solar		in 30^0-40^0 lat. in tropics	
Water		only small streams	
Nuclear		danger of contamination	
			5

44. *Illustration*

(i) Rolling stock and engineering goods with the highest value in export 1

(ii) Textile (Synthetic and ready made garments substituted export of raw-cotton) 1

(iii) Industrial development has increased 1

Explanation

(a) Our technological ability to use our raw-materials economically 1

(b) Shift to manufacturing instead of only extracting raw-materials 1

(c) reduce import of finish-goods 1 — 5

45. A(i) Labelling correctly for ½ each

15^0C and 25^0C ½ each

A(ii)

For correct location of each resource one mark for each should be allotted 1×3 3

(iii) For either continent showing population distribution using dot method 1 1

(iv) a. For neat drawing 1 1

b. For diagram 1 1

c Selection of Scale and not diagram	1	1
(v-vi) 1. For showing X and Y axis correctly	½	
2 For marking the scale correctly	½	
3 For drawing each bar correctly	1	2
(4 bars)		
(vii) Middle East—Iron, Iraq, Kuwait, Saudi		
Arabia South—East Burma, Indonesia	½	
(viii) A Doubas (Ukraina Region)		
B. Moscow region		
C. Volga Region		
D Magnitogosk	1	1
(ix) (i) A-Chicago		
B-New York	½	
(ii) C Ruhr	½	1

Question-Wise analysis

Sl No	*Objective*	*Specification*	*Content Unit*	*Form of Questions*	*Marks Allotted**	*Estimated difficulty level**
1	Knowledge	Recall	Population	0	1	C
2	-do-	-do-	-do-	0	1	C
3	-do-	-do-	-do-	0	1	C
4	-do-	-do-	-do-	0	1	C
5	-do-	-do-	Agriculture	0	1	C
6	-do-	-do-	-do-	0	1	C
7	-do-	-do-	-do-	0	1	C
8.	-do-	Recall Relationship	Energy (Minerals)	0	1	C
9	-do-	Recall	Industry (Classification)	0	1	C
10	-do-	-do-	-do- Location	0	1	B
11	-do-	-do-	-do- Power & Fert Plants	0	1	B
12	-do-	-do-	Industry Fact for Localization	0	1	C
13.	-do-	-do-	Transport	0	1	C
14.	-do-	-do-	Intertrade	0	1	C

Contd....

Sl. No	*Objective*	*Specification*	*Content Unit*	*Form of Questions*	*Marks Allotted*	*Estimated difficulty level**
15	Understanding	Recog	Population (settlement)	0	1	B
16.	-do-	-do-	-do-	0	1	B
17	-do-	-do-	-do-	0	1	B
18.	-do-	-do-	-do-	0	1	B
19	-do-	-do-	Settlement Growth	0	1	B
20	-do-	Recall	Agriculture	0	1	B
21	-do-	Cite Examp	Energy (Neuclear)	0	1	A
22	-do-	Indentification of Relationship	Energy-(Oil Resource)	0	1	A

O for Objective Type	+ A Difficulty
VSA Very short Answer Type	B Average
SA Short Answer Type	C Essay
E Essay Type	

5.3.7 Assignments, Practical and Oral Questions

The use of questions for assessement is common to tests which are closed book and those which allow reference to be consulted The type of questions used for assignments, project work, and practical tests are developed for the following purposes derived from the instructional objectives of the subject

1 approach and understanding of content.

2. to assess abilities to refer, organise, present and propose explanations using situations which have not been told to the learner during instruction

3 to compare the pupils ability to support the practice with theoretical explanations and verify hypotheses using a scientific method

4 To project the attitudes and values which the pupil possesses and states when interpreting or proposing alternatives to a problem in geography

Since the assignment or essay type question are really content specific the type of question has to the following aspects for course work and for essays in particular

1. The supply of the reading selections and portions of an index, data to be interpreted, maps etc

2. Questions which require the student to locate information, read and comprehend scientific information in which geographic understanding is assumed, and analyse the implications, effects or outcomes.

3. Requiring at least 500 words or if on a specific excursion or field work upto 2500 words.

The use of these assignments can be guided in the junior classes leading later to independent work at the senior secondary stage Assistance can be given during course work by the tutor and the eassays can be reworked for final submission.

The timing of the assignment is related entirely to the purpose of using it. If the idea is to develop the ability to identify and delimit a problem the assignment would have to be at the end of the teaching If the purpose is to enable students to describe the approaches, critically review the work already done, plan the techniques to be used for a survey the assignment has to be used during teaching

When writing an assignment some of the points which suggest the formation of a well thought out assignment are listed here.

1 The assignment question should be cohesive and considered useless to split into short answer or selected responses questions

1.1 Identify the character of valley slopes and stream bed and the features shown in the photograph given Instead a series of short answer question can be asked An assignment could also be given

1 2 On an excursion study of a stream what physical aspects could be identified and how can the process of their formation be inferred

2. The directional words used in the formation of an assignment must indicate the marking priorities

2.1 What hypotheses can you suggest that would explain why the process of industrialization in the British Isles has increased its dependence on imports whereas in France there is self sufficiency.

2.2 What are the similarities in the environment and resources available in Northern and Mediteranean Europe.

3. The placement of the data or text or maps before the question is best used when the same is to be interpreted whereas give after wards the texts are required to be analysed, commented on or compared.

On reading the passage given in the previous Chapter entitled Devouring the Potential it is possible to frame an assignment for seeing the learners ability to comprehend and summarise given information

Directions

The following ideas from a reading assignment fit logically into the outline. Enter each one in its proper position.

Irrigation facilities must grow and grow fast Plain areas can be best used as in the Indo Gangetic plain because water supply is assured, gravity flow is possible

In non Himalayan water supply is only possible from reserviors

Diversion canals and multi purpose projects are useful in plain areas and plateau areas respectively.

Increasing population and demand for food with non availability of more land

Private ownership of water sources like wells and tanks

Primitive use of irrigation by well, tank flooding.
Under utilization of irrigation is economic
Irrigation as a necessity for supporting expension of agriculture.
I. Main Idea——————————————
A
B
II. A
B.
C
III. Main Idea——————
A
B
IV. Conclusion
A
B

In another such assignment certain trends, opinions or geographical ideas are given and the students ability to analyse, deduce and verify these explanations can be done

Example.

1. The most striking spatial feature of Brazil is the high degree of concentration of human activity near the coast and decline of densities to the interior

2 The coastal areas of West Africa are densely populated reflecting the new era brought by colonial period. The sizeable clusters in the interior Savannah lands are a representation from the older civilizations

3. In China the continental interior Red Basin on the river Yangtze Kiang is the most densely populated area. The plain area and subtropical climate protected by the mountains of the north provide for this area to be used for farming

Examine the above statements and analyse the impact of growth of population on the spatial distribution and economic level

Practical Examinations in Geography

Schemes of Practical Examinations in Geography

The testing of practical skills in geography has become a part of the external examination only in the senior secondary and under graduate stages. The difficulty of providing laboratories and equipment have delimited practical work in geography to a scheme circulated by the Central Board of Secondary Education which has the following evaluation procedure.

Practical Test	
Viva	5
Practical Record Book	10
Field Survey Report	5
	30

(an illustrative practical example is given)

Considered and extention of theory the content of practical work in Geography is synonymous with quantitative methods, surveying, map making (sketches and diagrams), physical and chemcial tests are no longer a part of practical geography. With this conceptual shift in the identification of practical geography the objectives too need to be specified

From discussions on the nature of geography the objectives of Practical Geography can be said to include both

i. Physical and economic cartography techniques

ii. and statistical knowledge related to statistical techniques for representing data

Therefore there is a process element and a product element involved in practical work The process involved are listed here for consideration in respect to geography testing

Process :

1 Selection of data, methods, variables, phenomena from the physical social and economic environment which can be represented on maps, diagrams or statistically.

2 Selection of scale and size as also map projections for field survey, regional studies, economic maps

3. Preparing systematic and sequential plan for data collection on a field trip for an exhibition or presentation of report illustrations

4 Stating the advantages and disadvantages of using different cartographic methods, for processing data and representing them.

5. Maintaining instruments, using measures, calculating reading instruments, collecting data and field notes accurately

The techniques for examination and for evaluating course work that are best used for practical work in Geography are listed here:

Sl No	*Functional use of assessment*	*Area of evaluation*	*Technique/ Tools of Assessment*	*Mechanics of Exam / Test*
A	*External Examinations*			
	1 Certification	1 Practical	1 Test	1 1 Set exercises
	1 Promotion	2 Field work Report	2 4 1 Analysis	1.2 Viva voce
	3 Classification	3 Viva voce	2 4 2 Interview	2 4 2 Interview using oral test
	4 Judging quality by measurement	4 Practical Record book	2 4 2 Object identification test	
B	1 Judging development of practical skills	1. Labrotary exercises		
		2 Simulation Games	Analysis of product	1 1 Rating Scale of preformance
		3 Toposheet interpretation exercises		1.2 Rating Scale for product
		4 Field survey		
		5. Shetching + drawing of cartographic diagrams.		

6 makes correct choice of flow lines, dots, symbols, and colours for making a map of village and surrounding fields

7 draws graphs, maps, sketches, from field, photographs and based on topographical sheets using correct perspective and scale

8 Calculates statistical information to find relationship between geographical variables

9 undertakes a simple chain and tape survey using correct procedures, survey the social and economic characteristics using an interview schedule, tabulate the date.

10 explains orally the procedures, principles and concepts involved in survey

11. draws faithfully diagrams and sketches on field excursion

12 Sketches from photographs

Product

1 records the observed data in relation to the required simple cartographic diagrams and maps

2 interprets collected or given data to finalise the results of a experiment or practical work

3 draws relevant conclusions regarding geographical relationships

4 verifies the hypotheses and delimits the conclusion drawn

5 reports using technical terminology, maps sketches and diagrams.

Sl No	*Functional use of Assessment*	*Area of Evaluation*	*Technique/ Tool Used*	*Mechanics of Test/Exam*
B 2	Diagnosis and Remediation	—Exhibition —Collections —Transect maps —Sample Interview Schedules —Group work	—Observation —Pupils own evaluation report after field work	—Checklist —Product —Rating Scales —Product —Scale
3	Reinforcement of skills	—Practical Note book —Sketch book —Diagram based on data —Planning field work	—Testing	Practical Exercises
4	Improvement of Performance	—Laboratary work —Statistical Analysis —Field surveying —Physical —Social	—Observation —Testing —Object test —Criterion tests based on practical skills	Checklist Criterion referenced practical questions

Sl No	*Functional use of Assessment*	*Area of Evaluation*	*Technique/ Tools Used*	*Mechanics of Test/Exam*
5	Development of scientific attitude	—Field work practice —Group discussions —Exhibitions	—Evaluation Pupil —Observation	—Attitude Rating Scale —Checklist —Products scale

8. Designing A Practical Examination Test

Like the written examination the practical test or examination has to be planned for. The decisions are with regard to

- i. Objectives
- ii Content
- iii Type of practical questions
- iv Time
- v Options
- vi. difficulty level
- vii. marking + scoring instructions

I. Objectives

The weightage to objectives in practical work in geography are to

- I. Observation, Recording and Reading of data
- II. Drawing and Cartography Representation of data
- III. Reporting and Interpretation of data, maps diagrams
- IV. Related understanding

Obviously the information input and cognitive abilities are interred in the practical skills and hence do not have to be given a separate weightage.

II. Content

The elements of content in geography are clearly indicated in the syllabus as

1 Cartographic Techniques
2. Statistical Techniques/Quantitative techniques
3. Surveying and sketching in field excursions
    3.1 Physical
    3.2 Social
4. Map Interpretation of
    4.1 Topographical sheets
    4.2 Weather maps
    4.3 Geological maps

However the scope in terms of content are to be determined which will vary with age groups abilities

III. Types of practical questions

In this regard it is important to provide for 3 situations

1 Several batches of pupils

2. Coverage of all the abilities and content

These require that there be a main exercise with component parts or there are several small exercises Further, options to every exercise must be prepared

In class tests or course work assignments there is no rigour of having to cover all the content elements but only all the practical skills Therefore, a test or practical can be on map interpretation, map making, field survey, diagram or data processing, etc. (see sample practical test)

IV Difficulty level

In the setting of this ratio there are two requirements which decide whether the scores are to be used for certification, placement or promotion/selection

In case the purpose is certification the difficulty level of the questions could be 60% easy 20% average 20% difficult If the purpose is selection then it could be 40% easy, 40% average, 20% difficult. If the purpose is placement diagnosis for follow up remedial instruction then the weightage could be 20% easy, 30% avearage, 50% difficult.

V. Marking and scoring instructions

Developing the instruction to evaluators for conducting of the practical examination has to be supported with all the testing requirements for assessment also

Whenever the marks are to be awarded it must be for the skills as defined in the objectives and the alternatives answers should be provided with the variations in marks to be awarded, if any

When the assessment is qualitative the criteria and rating levels must be given, e g, if a practical book is to be assessed it should be possible to award 4 out of 4 marks, if 90-100% of the procedures, exercises and maps are complete, 3 marks if 75-90% exercises are complete, 2 marks if 60-74% exercises are done, and only 1 mark if only 50-60% exercises are done and zero mark if less than 50% exercises have been completed

The reporting quality of the examiner has to be very refined so that interpretation of practical results is not biased. Unlike the written examination the interpersonal interaction between evaluator and student is more and certain qualitative judgements have to be made after only one observation occasion

A reporting proforma for practical work has be developed here for the consideration of teachers for course-work, practical assessment and for public examinations

Practical Work Reporting Proforma

(For use by external examiners after scrutiny of class teachers and pupil records)

N B This report should be submitted within a fortnight of the examination

1 0 *Indentifying Information*
1.10 Name of examination
1 20 Name of School/College
1 30 Date of Examination
1.40 Name of Examination

2.0 *Form A · General Information about the School/Centre*
Summary of Practical
Examination Performance

No of cadidates . .. . Year .. .. Class ..... . Total No of candidates passed .. . . .

Marks obtained	Number	Percentage
30 and less (Fail)		
30-50		
50-70		
70μ (Distinction)		

Content of Examination

1 Space briefly report the conditions of the laboratory location of the school and equipment available.

Raating A B . C

2 Apparatus required :

Specify whether all the candidates could be provided the requirements of samples, sheets, graph paper, stationery, etc

Rating . A B C

Form B Reference and Individual examinees

3.0 *Pupils Performance*

(collection of data would be done using a rating scale (3 1) Marking Scheme (3 2) Checklist (3 3)

3.1 *Assessment of sessional work* *Tick*

Good	*Average*	*Fair*	
	3	3	3
Field work report	β	β	β
Practical note-book	β	β	β

3.2 *Assessment of practical test*

Q. No Mark obtained

3 3 *Oral Test*

No of questions	Correct	Wrong
Total Score		

Total 3 1	3.2	3.3 Scope	Total
*	+		☐

3 4 *Assessment of the plan and the Field book*

Aspects to be evaluted in the survey are the

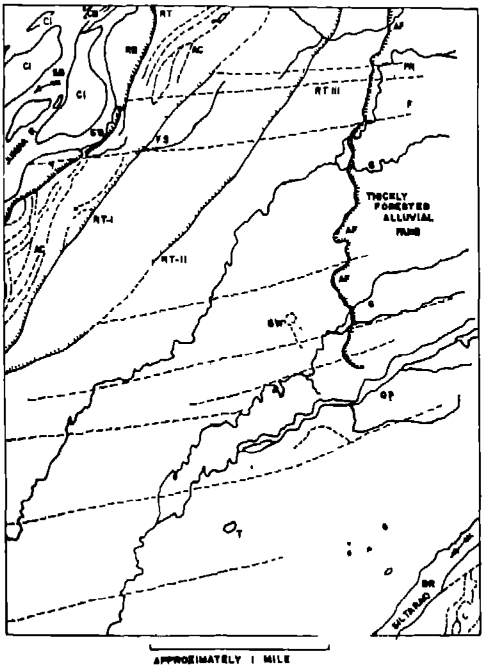
		Mark
1	Eye sketch map	2
2	Selection of Station and locating north	3
3	Field book	2
4.	preparation of plan	6
		23

The criteria for evaluting these aspects are neatness, methodical presentationnand accuracy. The break up of marks is as indicated above

Smaple Practical Exericses

1 In the figure given on page 30 identify the features P.C. V and draw a profile from A to B.
2. Study the toposheet UP 53F/15 on next page and answer the following questions.

What evidence is there to support that the fact that the water table is near the surface.
2. What shows that the rivers are followimg from hilly areas to the plain
3. What stage in the development of a river are the JUMNA and SITAL RAO Rivers. How does the braiding and channel islands form
4 The terraces are formed by the river or the stream and what evidence supports the fact.
5 What aspect of the rivers characteristics are indicated by the abandoned channels.
6. If rural settlements are to be located identify one likely site out of these given (I-V) and given reasons for the choice



Practical Exercises

Class XI
Time 1½ Hours
Total Marks · 30

Unit Test: Chain and tape Survey

	Item of the test observation	*Marks*	*Oral Assessment*		*Total*
			Viva	*of Product*	
1	Eye sketch map (Rough Plan)	—	2	2	4
2	Selection of Stations from chain line	—	2	2	4
3.	Laying of the north line	—	1	1	2
4	Measurement on the field correcting procedure	3	2	—	5
5.	Recording using Field Sketch	1	2	2	5
6	Choice of scale preparation of Plan	2	2	6	10
		6	11	13	30

Practical Test

Chain and Tape Survey

Class: XI
Time 1½ hours *Marks* 30

Survey the garden in front of the school using chain and tape Take at least 10 offsets on either side of the chain line. Plot on the basis of the field book entries on a suitable scale the areas surveyed also drawn at the scale on the drawing.
Marketing scheme of the Practical Test on Chain and Tape Survey

A *Instructions for Conduct of Test*

1 Surveying is to be done by a team of 6 students.
2 Plotting of the plan is to be done by each candidate from his own field book
3 Use the oral questions and observation schedule for assessing students when in the field and after plan has been prepared

B. *Oral questions and Viva* *Marks. 11*

1 When drawing the sketch map which features did you include and leave out. ½
2 Show where will the chain line be placed on this map ½
3 What use is this sketch map for surveying 1
4. What distance did you record between station A and B. Now actually measure the same 2
5. Explain how the north point was found ½
6 What is the purpose of laying the north line ½
7 What procedure did you follow to correct the closing error 1
8 When recording distance of offsets what points in the field sketch were used. 1
9 How was the tree, flower bed and fence beyond the point measures 1
10 Why was this scale can be chosen
11. What use could this plan be for a gardener, buying wire for the fence.

C. *Observation Schedule and Rating Scale of Actual Survey Procedure*

Each pupil is to observed at least twice for each aspect.
1. Correcting procedure and measurement procedure followed
2 Recording using Field Sketch.
3. Preparing plan and scale when drawing

In this observation schedule rate the pupil as Yes or No Tick against each

	Yes	No
1. The positioning of the arrows of the offset		
2. Tellying points with sketch		
3 Laying within using correct procedure		
4 Choose the objects to be measured		
5. Accurate reading of measurement of Offsets		
6. Relevant use of notations in field book		
7. Proportionate choice of scale		
8 Calculating the Representative fractions		
9. Participation in team work		
10. Speed in preparing Plan		
11 Relevant features indicated		
12. Drawing of scale		

Practicals

I Weightage to Objectives

	No of Questions	Marks		Minutes
Knowledge	5	5	2	16 7
Understanding	5	7	6	16 7
Application	5	3	4	16 6
Skill	15	5	8	50 0
	50			100

II. Weightage of Content

Methods of representing data	10
Field work and Socio-economy Survey	10
Practical work book/Sessional	10
	30

III. Weightage to forms of questions

	No of questions	Time
	4 × 2 = 8	10
	3 x 4= 12	15
	20	25
Viva Voce and Practical book	10	5

Viva voce

2 questions are to be asked from methods of representing data

3 questions are to be asked from fieldwork and local survey

Blue Print

Units
Maximum Marks

Class· XII
Time 2 hrs

Sl No.	Objective / Content form of Unit Question	Knowledge				Undertaking				Application				Skill		Total
		E	SA	VSA	O	E	SA LA	V SA	O	E	SA	VSA	O LA	E	SA	
1	Methods of representing Data								2(1)						8(2)	10(2)
2	Socio economic or Local Survey 1 Market School 2 Traffic Locality Village (Amenities)						2(1)		8(2)						10	
	Total						2		10				8			20

Notes· Figures within brackets indicate the number of questions and figures outside the brackets indicate mark

* Denotes that marks have been combined to form one question

Summary

Long Answer (LA)	No	4	Marks	16	Scheme of Options
Short Answer (SA)	No.	2	Marks	4	Scheme of Section
Very short Answer (VSA)	No.	5	Marks		
Objective(O)	No		Marks		
		20		20	

Practical Geography

Section-A

1. What is the catchment area of a school and on what basis is it delimited?
2 How is dot method better than Choropleth method for showing population distributions?
3 Identify the various steps that are followed in conducting a survey giving examples from the survey done by you

4. Prepare a questionnaire of not more than 6 questions for conducting a survey of welfare amenities in your locality

OR

Section-B

1 Show the following data with a line graph

Production in Mn tonnes	*1980-81*	*1979-80*	*1978-79*	*1965-66*	*1960-61*
Food grain	129 9	109 7	131 9	72 3	82 3
Jute	6 5	6 1	6 5	4 5	4 1
Sugarcane	15 2	13 3	15 7	12 8	11 1
Cotton	7 9	7 7	8 0	4 9	5 6

OR

Construct a bar graph to show the following data on population below poverty line in 1979-80

Percentage of total population

	Rural	*Urban*	*Total*
Andhra	43 39	35 68	42 10
Bihar	38 91	46.07	57.49
Uttar Pradesh	50 23	49 24	50 09
Punjab	11 87	24 66	15.13
Orissa	68 87	42 19	66 40

2. Draw a pie diagram to show the following exports from India in 1979-80 to different countries in Rs (crores)

Actual Exports

Africa	317 6	5 76
America (North)	889 3	14 42
East Europe	844 8	14 02
European Common Market	1726 8	28 94
ESCAP	1626	26 97
ECFWA	602 4	9 99
	6026 9	100 00

OR

On the map of India showing air routes draw a flow diagram using a scale of 1 mm = 1 flight to show the number of flights between the given stations

Banglore	Bombay	2
	Delhi	2
	Madras	6
	Hyderabad	2
Madras	Bombay	3
	Calcutta	2
	Hyderabad	2
	Delhi	3

Source Indian Airlines Time Table

Marking Scheme

Section-A

1. (i) The catchment area of the school is the residential areas from which children come to a school 1

(2) It is delimited on the basis of the intensity of movement 1 2

2. (i) Do method is better than a choropleth map to show population distribution because

a Unlike a choropleth map actual numbers in proportion to each other not percentages is used. 1

b. The location wise size of population can be accurately plotted and not at a district or tehsil level 1

c Urban and rural population distribution can be shown on one map using different types of dots but 2 choropleth maps will have to be shown (Any 2) 1 2

3 (i) Identification of problems and area-statement of the issues/facts investigated 1

(2) Preparation of base map and questionnaire 1

(3) Data collection 1

(4) Processing of data interpretation 4

(5) Recounting of problems faced in the study (ability to summarise conclusions of the study done) 1 4

4 (1) General information on locality characteristics
  (2) Lisiting of amenties and suggestion of how data will be collected (observation)
  (3) Questions on quality of the amenities as asked to residence on
    i) accesibility
    ii) rating of dweller
    iii) need for change
    iv) maintenance rating
    v) problems you have due to the amenity

OR

Section-B

1. (1) Selection of suitable scale to show production 1
  (2) Equal internal for showing years 2
  (3) Use of different types of lines to show various crops or correct labelling of lines 1 4
  (4) Neat, correctly marked values 1

OR

(1) Selection of correct scale ½
(2) Labelling of bars according to states ½
(3) Use of different symbols of distinguish rural from urban bar showing population ½ 4
(4) Neat and accurate diagram 2½

2. Calculation of proportion

Africa	5.76	20.73
North America	14.42	51.91
East Europe	14.02	50.47
ECM	28.84	103.82
ESCAP	28.97	97.09
ECFWA	9.99	35.98
	100.00	360.00

Labelling amount of export and country 1
Correct proportion and angle 1

Marks are to be awarded if calculation of angle is correct Calculation are not be awarded any marks.)

Design of the Practical Unit Test on Diagrammatic Representation of Data

Class XI
Time 60 Minutes

Total Marks 30

S. No	*Form of Exercise*	*Observation and Recording and Processing of Data*	*Drawing and Cartographic Representation*	*Reporting and Interpretation of Diagrams*	*Related Understanding*	*Total Marks*
1	Representing pupulation size of towns using proportionate circles for 4 towns	4	4	2	2	12
2.	Flow map showing the movement of import commodity to India	4	5	1	—	10
3	Two line graphs showing on food production developed in developed and developing countries 1970-1979	2	3	2	1	8
		10	12	5	3	30

(Diagrammatic Representation of Data Using cartographic Techniques)

Class · XI

Time 1 Hrs
Total 30 Marks

1. Use the graph paper map of India and world map for the questions as indicated
2 All calculations are to be made in the answer book using a calculator, if needed.
3 Interpretations are to be written in the answer book serial wise
4. Marks will be awarded for neat, correctly labelled and complete diagrams

1. Given below are the data for 4 towns of India. Use circle method to show their location and relative size of the outline map of India provided to you Choose suitable scale of representative and state the basis of your choice Workout necessary circulation on the answerbook

	Name of Town	Population in 1981 (in thousand)
1	Amritsar	589
2	Bangalore	2914
3.	Kanpur	1688
4.	Vishakapattanam	594

On the given world map land and sea routes are marked Select the appropriate land or sea route and draw a flow map showing the volume export of tea from India in 1980 to the columns concerned Use a suitable scale for this purpose and explain reasons for your choice Name the port/city where the route is terminating as so the name of the country

2	*Name of importing countries*	*Export Tea in 1000 Kgs*
	UK	45,509
	USSR	63,838
	Netherlands	1,198
	Algeria	8,290
	Sudan	11,508
	USA	11,787
	Iron	10,302

3 For the given data of the world index of Food Production draw 2 line graphs (on the graph paper provided), one using a scale of 1 em —25 points

	Developed Countries			*Developed Countries*		
	United States and Canada	*U S S R & Eastern Europe*	*Western Europe*	*America*	*Africa*	*Asia*
1970	112	126	115	129	117	126
1971	128	129	121	131	120	128
1972	124	130	121	130	122	128
1973	126	140	124	139	119	133
1974	117	143	129	145	125	137
1975	131	133	125	152	120	149
1976	140	149	123	158	132	156
1977	144	147	129	163	129	161
1978	146	157	136	168	131	166
1979	145	145	134	173	134	163

Base Year 1961-65 = 100

Source USDA (1980) 5

i What is the major conclusion regarding food production in developed and developing countries which can be identified from the graph

ii In which of the developing countries was there a chronic shortfall in food supply

1 (7)

Exercise S NO	Marking Scheme	Value Points	Total Marks
1 (a)	Calculation of correct drafting radio by dividing by 10 and multiplying by 4 as given 1 15.34 mm 2 30 41 3 27.52 4 15 42	½ mark each	4
(b)	Draws using proportionate circles according to the calculated size	½ mark each	4
2. (a)	Calculate size of flow lines for the commodity from each country (5 mm) 1000 m tonnes 1 45 mm 2 63 3 1 4 8 5 11 6 13 7 11 8 10	½ mark each	4
(b)	draw flow lines of correct thickness on the routes marks legend	½ mark each	4 6

	(c)	Naming countries with the largest	½	
		volume of imports and the least from	½	2
				(12)
3	(a)	Calculate the graph X and Y axis for the years 1970-79	¼ mark each	2½
	(b)	Represents with		
		i Correct labelling	½	
		ii Joining of lines using different symbols for developed and developing countries	1 mark each line	2½
	(c)	i The food production in developed countries is as much as in quantity as developing countries but increases is lower	1	2
		ii Africa	1	

CHAPTER VI

Using and Reporting Test Results

When preparing a test every care is taken to make it a good test This is done by defining the objectives selecting the content, allocating the type of question to be asked and seeing that a balanced question paper, is prepared. However, after conducting the test, and scoring it for marks the test is discarded. What we are failing to do is to find out the strength and weakensses of the test after it has been answered by the class and interpreting the results in that light.

In the development of a test therefore tryout is useful in order to appraise whether the test will actually a good measure of what the children have learnt and if we can say with surety what the quality of the child's performance is. Once the quality of the test is improved then the results can be interpreted in order to judge the teacher effectiveness, get feed back on how to improve learning and even prepare children better for the promotion examination.

The evaluation of the test is possible by logically studying each item in order to identify whether it tests the objective expected and reject such question where answers have been vague or improve such multiple choice questions as have distractors which are not functioning properly

For example in the following question:

Pygmies have adjusted their way of life to the resources of the available and have little impact on the environment Explain with examples from the economy of the Pygmies

Logical analysis of the question leads to the following observations.

Objective To recall the life of Pygmies and their natural environment

To interpret how the daily life in determined by environment

To illustrate how the interaction with environment is mainly dependent and the changes made by the Pygmies is minimum.

However such logical analysis has utility only to the extend of finding out the relevance or validity of the question and does not indicate how exactly the students would tackle the question. The nature of instruction and students own experiences would also alter whether the item turns out to be easy or difficult Another purpose of analysis is to find out whether the test question is able to discriminate those who do well from those who do not. Identify whether the item measures correctly the objective identified to be tested. The analysis of each question both of the short answer and multiple choice type help find out whether the answers expected and those children give are similar and what learning misconceptions have occured

If the test is meant for promotion then there is need to find out if the item is answerable by those who have studied and there is no possibility of guessing by those who have not studied Similarly if the test is meant to find out which students have not learnt the concept, again the item must be able to separate those content areas which have been learnt from those which have not been learnt This value which can be calculated is known as the item discrimination value

Another information about a question is as to whether the question is too difficult for the class or the students who usually do well found the question difficult but those who do badly found the question easy Each question, if of the multiple choice variety, can also be analysed to find out how effective the alternatives are. Such analysis is also useful for the teacher to find out which aspect needs to be further taught

When the test is to be analysed so as to prepare a test for promotion or ranking in a class, there is need to include only such items in the test which discriminate between high and low achievers and is at varying difficult levels.

Using the example of a 26 item multiple choice question test on, water cycle and states of water administered to 47 class III children here are the steps to undertake the analysis of question

1. Mark all the answer books and find the total marks as also indicate how many questions are not answered at all.

2 Arrange the total papers in this example of 47 students from highest to lowest marks Suppose here that the maximum marks is 21 and minimum is 12 out of 26 questions

3. Select the 10 papers with highest total score and 10 papers with the lowest total score

4. Set aside the middle 27 papers They will not be used for the analysis.

5 For each question tabulate the number or students in the upper and lower group who selected each alternative.

6. Compute the difficulty level as follow R/T is the number of pupils who got the item right and denote number of pupils who tried the item.

Item Difficulty R/T × 100

7 Compute the discrimination index by subtracting the number of pupils in the lower group who got the item right (RL) from the number of students in the upper group who got the item right (RL) and dividing this by 1/2 of the total number of pupils included in the item analysis (1/2T).

$$\text{Item discriminating power} = \frac{RA - RL}{1/2T}$$

8. For an essay type question the formula for finding the difficulty level based on Dr. R. Whitney and D L Sobers is·

$$\text{Difficulty Index} = \frac{SH + Sl - (nT)\,(X\ min)}{nT\,(Xmax - Xmin)}$$

Where·

SH=sum of the scores on the item multiplied by the number of students getting that score in high group.

SL = Sum of the score on the item multiplied by the number of students getting that score in the low group

Xmax = Maximum possible score on the item.

Xmin = Minimum possible score on the item

nT= Total number of papers of high and low group

Here is an example of how to calculate the difficulty level using the data for a essay type question given to a group of 20 students, 10 of whom were high achievers and 10 were low achievers.

Marks obtained on a 5 mark long answer question 1	*No of students getting the mark* 2		*Marks multiplied by the number of students* $1x^2$	
	High group	*Low group*	*High group*	*Low group*
5	2	0	10	0
4	3	1	12	4
3	4	4	12	12
2	1	2	2	4
1	0	2	0	2
0	0	1	0	0
	10	10	36	22

$$D\,L = \frac{36+22-(20)\,(0)}{20\,(5-0)} = 53/100 = 0\ 58$$

The discrimination index for essay type question is found by a formula given by Harper as

$$\text{Discrimination Index} = \frac{1.5\ MV\ \&\ ML}{\text{max marks of the question}}$$

where

MV is the mean mark of the upper 1/5 group on the question,

ML is the mean mark of the lower 1/5 group of the students

In order to improve multiple choice item itself there is a need to analyse the quality of responses and find out whether the question has really tested what it should The method of doing such on item analysis is given here

For each distractor note down how many of the students in the upper group and how many in the lower group gave each of the distractors and key as the correct answer

Example

Question *Pupils* *Index*

1 With very low temperature water changes into

A Vapour	HG	LG	Diff	Disc
	03	03	8/20 × 100	6-24
B Steam	01	00		½ × 20
	06	02		= 4/10
C. Cl	00	05		= 0 4
D gas			= 40%	
	10	10		

When the weather is hot and cloudy the weather beccomes	HG	LG	Omit	Index Diff	 Disc.
A cold	00	02	0	17/20 ×100 = 85%	$\frac{10-7}{\frac{1}{2}20}$ =0.3
B hot	00	00			
C rainy	10	07			
D dry	00	10			
	10	10			

(Data based on the Criterion Referenced Test developed for a ERIC project of NCERT. Pritam Singh 1985)

In the above examples in the first question it is the second distractor *steam* which is not selected by any one and has to be replaced perhaps Ice *crystal* would have been a better distractor for ice is the right answer. Similarly is the case with *dry* in the second example. However both the item are different in that the first is more difficult, but similar in their discriminating power. Usually a discrimination of between 0.4 to 007 is considered good and a difficulty level between 40%-60% for an achievement test

These statistics for each item when continued would constitute the reliability of the entire test Reliability is the extent that the test gives the same results from one test to another. Reliability is of course influenced by the group which was involved and the form of test used. However the reliability of the test alone does not ensure that it is a good test It must also be valid. validity is the quality which indicates that the test is related to what it purposes to test This is essentially better performance on the test is good indicator of the future performance in that subject of the candidate. Validity is also indicated if the questions of the test are based on a definite objective and content area using a relevant tool for testing it.

When planning a test therefore taking account of the following aspects will contribute towards improving the validity and reliability of the test.

Shortcomings in the present question papers		Suggestion for improvement	Resulting improvement
Emphasis on memory testing	a	Select objectives to be tested	
	b	Give desirable proportionate weightage to them	Validity
	c	Set questions testing these objectives	
	d	Try to cover adequately the different specifications/abilities	
Inadequate content coverage	a	Divide the syllabus into units of learning	Validity
	b	Give appropriate weightage to each unit	Reliability

	c	Set questions based on these units	
	d	Eliminate overall options	
	e	Include more short answer type questions	
Poor coverage of abilities tested	a	Include different forms of questions	Validity
	b	Give appropriate weightage to different forms of questions	
Include more short	c	answer type or objective type questions	
Subjectivity in setting	a	Provide a design for the paper setter	Reliabillity
	b	Ask for blue-print from the paper setter	
Examiners subjectivity in scoring	a.	Introduce objective type questions	
	b	Prepare a detailed marking scheme and scoring key	
Examinee's subjectivity in attempting the questions simpe and clear language	a	Word the questions in a simple and clear language to delimit the scope of expected response	Reliability
	b	Use appropriate directional words pertaining to specifications	
	c,	Indicate part-wise allocation paper when more than one part are there	

The calucate the relability of a test a easy technique is that given by Saupe popularly known as K-R-20 Reliability

$$1 - \frac{0\text{-}19K}{(S.D)\ 2}$$

To calculate S.D. a simple formula is

$$\frac{\text{sum of } 1/6 \text{ of the high group score—sum of } 1/6 \text{ of the group with lowest score}}{1/4 \text{ of the total number of students } (N)}$$

if the class is a small one could use N—1 in place of N. K represents the number of items in the test

Validity is of course also calculatable by correlating the number of questions testing different objectives with a general list of objectives to the tested. Validity could also be judged by correlating a high achievers performance in other tests with the test presently given to see if it is a good predictor of performance. Apart from this judgement of other teachers on the quality of the questions is also a good indicator of validity of the test.

Just by constructing a vaild and reliable test with question which are objective based evaluation cannot be done, unless the analysis and reporting of the results is not done rationally. Marks are the mumerieal record of the pupils qualitative performance Its limitations are that the absolute number does not convey much. These marks become meaningful when the quality of the mark is stated This quality is indicated by whether the marks obtained is average, high or low as compared to the whole class. The maximum marks obtained in previous years and the mark obtained now when compared would indicate if the child has learnt well or needs help

Marks are of several uses; it could be an absolute number or a grade, it would be very reliable are more valid but not so reliable like when altitudes and habits are also assessed Marks could be awarded for each student in comparison to the maximum marks she should get in the test or keep a cut off score of 30% or even 40%. In the examples given earlier of evaluating project work or assignments and even the quality of practical work the use of grades is shown. Even to report the actual performance grades could be used instead of marks with the points of the grades defined in terms of the mark like 0-30% (needs improvement) 30%-50% B (average) and 50%-70% A (good) and 70 + A+Excellent.

After reading through a test the teacher assigns a mark for the test. Similarly in different tests taken all round the year and in other subjects. Finally these marks are compared or added to give the final mark for the child. Now there is need for us to think whether this is fair. We use different tests, some are easier, others more difficult Even the subjects vary in difficulty and yet we add all the marks together.

To overcome this there is need to convert the scores so that the marks obtained by one child is comparable with that of another child or the marks got in one subject are comparable with that of another subject The derived scores can be classified into

Category	*Conversion Technique*	*Usefulness*
1 Comparison with an absolute standard	Converted actual score in relation to the criterion score	The expected standard and acutal achievment can be found out
2. Comparison between individuals	(i) conversion according to the mean and standard deviation of the marks of the group (ii) coversion into ranks or percentages	Easy comparison since the mean and S D. of the marks makes the conversion relative

There are several types of scores that can be used in testing All of these are based on the same principles that raw marks can be coverted to a common scale that has equal units and that can be readily interpreted in terms of the normal curve (Gronlund. 1976) The most common types are Z score and T score which are illustrated here. The Z score expresses whether the raw score is above or below the mean in terms of standard deviation units

The formula for the calculation of this score is

$$\frac{X - M}{5 - D}$$

Where X = any raw score.
M = arithmetic mean of raw score.
SD = standard deviation of raw score

In the data of 50 students given here the Z- scores have been calculated, it is to be noted that the score is in a fraction and has negative score like those of students 41-50 which is cumbersome to use for reporting. It order to overcome this the Z-score is converted into a T- score calculated as

T-score = 50 + 10 (z).

Following is an example of converting the raw scores into standard score for a test in Environmental Studies.

Students *Roll No.*	*Marks* *(Actual)*	*Z-score* $\frac{X-m}{SD}$	*T-score* *50 + 10 (z)*
1-2	23	0.97	59.7
3-7	22	0.78	57.8
8-11	21	0.59	55.9
12-18	20	0.39	53.9
12-23	19	0.19	51.9
24-32	19	0.12	51.9
24-32	18	0.00	50.0
33-38	17	0.19	48.1
39-42	16	0.30	46.1
43-45	15	0.52	44.2
46-48	14	0.78	42.2
49-50	13	0.97	40.9
Σx	898		

To find the mean, the scores are added up (Σ X) and divided by the total number of students (n-50)

$$\frac{\Sigma x}{n} = \frac{898}{50} = 18$$

To find the S.D. (Standard Deviation)

$$SD = \frac{\text{sum of } 1/6 \text{ of highest score - sum of } 1/6 \text{ of lowest score}}{\text{¼ of total number of students}}$$

$$SD = \frac{177 - 113}{12\ 5} = \frac{64}{12\ 6} = 5\ 12$$

When we have data available to us after giving a test on the performance in different subjects or the performance on different objecteres then several interpretation are possible which are useful for us as teachers, some to be told to the child others sent to the parents and even the employers (Singh 1981 with modification). Such interpretations help review the objectives, teaching learning strategies and then the textual materials

Marks obtained by Students of Class VII in Social Science

	1	2	3	4	5
No. Subjects	(marks obtained in percentage)				
History	41	10	40	50	38
Geography	64	28	80	70	69
Civics	58	23	64	22	56

Here we can see that the class is poor in History and on an average do better in Geography than either Civics or History This helps up under stand that more time is needed for the other subjects. This also indicates that teaching has been more effective in Geography than in History or Civics. Such performance also indicates the need to review the content of History and Civics so as to find better materials.

Another type or data can also be collected regarding the ability to understand or apply the learning of the concepts and information taught

Students R. No	1	2	3	4	5
		Percentage marks			
Behaviourial outcomes					
1. compares	70	80	85	83	75
2 gives examples	10	25	40	60	10
3. interprets	15	19	23	20	15

Here again we see that pupils are mostly able to compare between phenomena but find interpreting difficult and need further training.

Such analysis is not usually done but with the growing dependence on marks for gauging performance teachers must try and use the techniques discussed here to make results useful. The decisions that such analysis help teachers take, supports the need to use them more often. Moderating the results depending on the analysis allows the teacher to make a fair decision and help the learner achieve better

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